Indicators of urban health in the youth population of Kuwait City and Jahra, Kuwait

Fayez Alzarban

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Declaration

No portion of the work in this thesis has been submitted in support of an application for any degree or qualification of the University of Liverpool or any other University or institute of learning.

Signature

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List of Abbreviations

ADHD	Attention Deficit Hyperactivity Disorder
AIDS	Acquired immune deficiency syndrome
BMI	Body Mass Index
CDC	Centres for Disease Control
COPD	Chronic obstructive pulmonary disease
CSDH	Commission on the Social Determinants of Health
DEFRA	Department for Environment, Food and Rural Affairs
ECHI	European Community Health Indicators
ECRHS	European Community Respiratory Health Survey
EHIS	European Health Interview Survey Questionnaire
EMRO	Eastern Mediterranean Region
ESPAD	European School Survey Project on Alcohol and Other Drugs
FAS	Family Affluence Scale
GCC	Gulf Co-operation Council Countries
GDI	Gender Development Index
GIP	Global Influenza Programme
GYTS	Global Youth Tobacco Survey(s)
GSHS	Global School-Based Student Health Survey
HBSC	Health Behaviour in School-Aged Children study
HDI	Human Development Index
HEART	Health Equity Assessment and Response Tool
HIV	Human immunodeficiency virus
HRBQ	Health Related Behaviour Questionnaire
IMR	Infant Mortality Rate
ISAAC	International Study of Asthma and Allergies in Childhood
LDAC	Least developed Arab States

List of Abbreviations (contd.)

LUZ	Larger Urban Zone
MDG	Millennium Development Goals
NHS	National Health Service
PNM	Perinatal Mortality
RTA	Road Traffic Accident
SDQ	Strengths and Difficulties Questionnaire.
SES	Socio-economic status
SILC	Survey on Income and Living Conditions Questionnaire
TB	Tuberculosis
TFI	Tobacco Free Initiative
UA	Urbanised Areas
UC	Urban Clusters
UK	United Kingdom
UHI	Urban Health Indicator
UMP	Urban Management Programme
UN	United Nations
UN HABITAT	United Nations Human Settlements Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNICEF	United Nations International Children's Emergency Fund
UNFPA	United Nations Populations Fund
URHIS	Urban Health Indicator System
URHIS-2	Urban Health Indicator System (Part 2)
US	United States
WHO	World Health Organisation
WP	Work Package

Abstract

Introduction: Kuwait, a country situated in the Middle East, is one of the most urbanised countries in the world and with a large proportion of young people. The government of Kuwait has acknowledged the importance of understanding the needs of its youth population in its current healthcare policy focusing on three main health issues: overweight/obesity, tobacco and cannabis use, and general mental and psychological health. However, little is currently known about the health status of its young people due to the limited epidemiological data at a national and city level. As Kuwait is considered part of the Arab States, it is essential to understand the cultural and social dynamics shared by young people living in the region.

Objectives: To describe, compare and summarise the urban health profile of the youth population in the State of Kuwait, aged 14-16 years, in two Kuwaiti cities: Kuwait City (an affluent city with high economic activity) and Jahra (a less affluent, more deprived city), with a focus on the three urban health topics highlighted in the current Kuwaiti healthcare policy: overweight/obesity, tobacco smoking and cannabis use, and general psychological health. The urban health issues found in young people in Kuwait City and Jahra, Kuwait were compared to the findings in European cities in the EURO-URHIS2 study in 15 youth urban health indicators.

Methods: Validated and standardised urban health indicator (UHI) questionnaires, specifically designed for young people, were adopted from a large European Health Survey (EURO-URHIS2 project) developed to collect relevant and comparable data on the health and its determinants in young people residing in cities. The EURO-URHIS2 youth questionnaire was translated to the Arabic language and piloted in schools in Kuwait prior to conducting the survey. Data were collected in a classroom setting in Kuwait City and Jahra, Kuwait.

Results:

Comparisons of urban health profiles for young people in Kuwait City and Jahra: 530 students were surveyed in Kuwait City and 527 in Jahra. Significant socio-economic status differences (measured by Family Affluence Scale) were observed between the two cities, with students in Kuwait City reporting higher family affluence scores than in Jahra. Compared to Kuwait City, young people in Jahra reported an overall poorer urban health profile and significant differences were observed in health status, lifestyle factors and environmental factors. The poor health situation, both in terms of health and determinants of health, was more apparent in girls in Jahra compared to girls in Kuwait City.

Priority Urban Health Indicators for Kuwaiti public health policy: Overall, a very high proportion of students from both cities (approximately 60%) were found to be overweight and obese, and approximately one third of students in both cities were obese. Unhealthy dietary factors were widespread in both cities, particularly in the high consumption of sugar-rich products and fizzy drinks and the low consumption of fruit and vegetables. In both cities, only 1 in 3 students reported regular consumption of fruit and less than half of all students reported regular consumption of salads and vegetables. Consumption of fizzy drinks and sugar-rich food products was significantly higher in Jahra than in Kuwait City. Low engagement in physical activity was widely reported in both cities, with less than 1 in 10 students engaging in the WHO recommended daily physical activity. In Kuwait City, students that engaged in weekly vigorous or 60 minutes of daily physical activity were significantly less likely to be obese. Additionally, obese students in Kuwait City were significantly more likely to perceive their health as poor.

Smoking appeared to be predominantly an issue for boys rather than girls in both Jahra (OR=11.05) and Kuwait City (OR=9.80). Half of the boys in both cities reported smoking tobacco in the past and approximately 1 in 5 were daily tobacco smokers. In both cities, students that self-reported living in an area with crime, violence and vandalism were approximately 90% more likely to have ever smoked tobacco. In Jahra, elevated risk of psychological distress (measured by SDQ scores) was independently associated with (ever) smoking. While cannabis use was highlighted as a Kuwaiti government public health priority, only 3% of students reported using cannabis in the past in both cities.

In terms of mental health, self-reported psychosomatic symptoms were significantly more common in Jahra compared to Kuwait City. Elevated risk of psychological distress was reported two-fold higher in Jahra than in Kuwait City, with the highest proportion reported in girls in Jahra (27%). Girls were 66% more likely than boys to be at an elevated risk of psychological distress in Jahra. Students that were victims of bullying were more likely to report an elevated risk of psychological distress in both cities. Environmental indicators, such as living in an area with crime and violence and exposure to severe noise, were independently associated with psychological distress in Jahra.

An extremely high proportion of youths in both cities reported suffering from low back pain (LBP) in the past month and this was significantly more pronounced in Jahra (75%) compared to Kuwait City (64%). Gender was independently associated with LBP in Jahra, with girls twice as likely than boys to report suffering from it. In both cities, elevated risk of psychological distress was independently associated with LBP. The presence of other psychosomatic symptoms was significantly associated with LBP in Kuwait City. In Jahra, environmental indicators continued to carry an importance with

students that lived in an area with crime/violence were significantly more likely to suffer from low back pain.

Comparing the findings in Kuwait City and Jahra with the EURO-URHIS2 project: In terms of health status UHIs (self-perceived health, psychological distress, psychosomatic symptoms), Kuwait City appeared to show a similar picture to that of the EURO-URHIS2 project average for young people, with the exception of LBP where it was reported higher than in Europe. Jahra students presented with higher rates of adverse health status attributes than Kuwait City and the European mean, with Jahra girls reporting higher rates than boys.

For UHIs in lifestyle factors, the overall prevalence of self-reported physical activity was lower in Kuwait City and Jahra than in the European mean in the EURO-URHIS2 project and the prevalence appeared to be considerably lower in girls for both cities compared to Europe. Regular fruit consumption was lower in Jahra and Kuwait City than the European mean, while regular vegetable/salad consumption was similar to the European mean in Jahra but lower in Kuwait City. With regards to daily tobacco smoking, the prevalence in Kuwait City and Jahra appeared to be similar to the European mean for boys only, while the prevalence for this UHI was lower than the European mean for girls in both cities.

There were clear environmental UHI differences between Kuwait City, Jahra and European cities. While crime, violence and vandalism were self-reported higher in Jahra compared to Kuwait City, the prevalence was lower than the European mean. Bullying appeared to be more of an issue in Jahra, (and to a lesser extent in Kuwait City) compared to Europe, particularly in the high prevalence reported by girls. The proportion of students who were involved in a road traffic accident in both cities was slightly higher than the European mean.

Conclusions:

Young people in Jahra, particularly girls, face poorer health status in many key urban health indicators compared to Kuwait City. The findings of this research in young people present a similar picture of the social and gender inequalities observed in the limited epidemiological data on the adult Kuwaiti population in Jahra compared to Kuwait City. As the current Kuwaiti Healthcare Legislative Plan is being revised in 2019, there is a need to address the main findings observed in this research for public health policy indicators (overweight/obesity, tobacco use and mental health). With regards to the alarming rates of obesity, two possible drivers in determining childhood obesity need to be addressed through policy in Kuwait: unhealthy dietary intake and low engagement in physical activity. Policy efforts should aim to reduce population BMI, using measures such as

improving “nutritional literacy”, school and family-focused behavioural interventions. Considering the findings presented in this research for tobacco use, efforts to tackle its use in young people should remain a priority for public health policy in implementing effective tobacco strategies, both in terms of upstream and downstream interventions. There is a need to address the lack of implementation of anti-smoking laws, including package warnings and anti-tobacco advertising, and smoking cessation programmes in clinical settings. For mental health, the findings of this research indicate that efforts must be made to improve the social environment, particularly in the school setting. Due to the alarming prevalence of LBP in both cities, and its known presentation as a psychosomatic symptom, this indicator should remain a focus for future research in Kuwait. Future Kuwaiti public health policy should take into consideration the observed differences between the two cities and national or targeted policies should not widen existing health inequalities. While there is a dearth of epidemiological research with respect to urban health in youths, the findings of this study could provide a baseline for future public health research in Kuwait and other Arab States.

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1. Introduction:

1.1 Overview

It is estimated that more than half the world's population live in urban areas [1]. Living in cities and factors associated with urban living can have an impact on its citizens and their health and well-being and can start early in life [2]. It is therefore important from a public health and policy perspective to assess the unique characteristics of urban living that affect health and its related risk factors in young people.

Kuwait, a country situated in the Arab States, is one of the most urbanised countries in the world and with a large proportion of young people. The government of Kuwait has acknowledged the importance of understanding the needs of its urban youth population in its current healthcare policy focusing on three main health issues: overweight/obesity, tobacco and cannabis use, and general mental health[3]. However, little is currently known about the health status of its young people due to the limited data at a country and city level.

This research will attempt to describe and summarise the main urban health issues of young adolescents (aged 14 to 16 years) in the two largest Kuwaiti cities: Kuwait City (an affluent city with high economic activity) and Jahra (a less affluent, more deprived city with a greater proportion of inhabitants from a traditional tribal background).

Validated and standardised urban health indicator questionnaires, specifically designed for young people, were adopted from a large European Health Survey (EURO-URHIS2 project) developed to collect relevant, comparable data on the health and determinants of young people residing in cities. Data were collected using the survey approach recommended in the EURO-URHIS 2 project. The project had a focus on the three urban health topics highlighted in the current Kuwaiti healthcare policy: overweight/obesity, tobacco smoking and cannabis use, and general psychological health.

As Kuwait is part of the Arab States, it is essential to understand the cultural and social dynamics shared by young people living in urban settings in the region. The Arab States has witnessed rapid urbanisation, and the literature suggests that there are common risk factors in the young Arab population despite the economic differences between Arab countries. Therefore, the existing literature on the health of young people in the Arab States was carefully reviewed, to highlight any key findings that are relevant to the assessment of urban health indicators in young people in Kuwait, prior to commencement of the survey.

The background section of this thesis will be divided into two main sections. The first section (Chapters 2 and 3) concerns the literature on urbanisation, urban health, and the Arab States and the health of its young people. The second section (Chapter 4), will focus on the State of Kuwait and its two main cities, Kuwait City and Jahra, and the limited existing literature on the health of its young people.

1.2 Outline for chapters in the thesis

This thesis is composed of 11 chapters. The overview below will briefly summarise and describe the outline of each individual chapter.

Chapter 2 (background) summarises the key literature on urban health and how urbanisation may influence the health and wellbeing of individuals living in cities. It will then lead into a brief overview of previous methods of assessing urban health, as well as introducing the EURO-URHIS 2 (European Urban Health Indicators System Part 2) project that provided standardised tools and methodologies adapted for this research.

Chapter 3 (background) will focus on the Arab States given the context of this thesis and the target population of young people in Kuwait. As Kuwait is a member of the Arab States, it shares a similar cultural and social background with other Arab countries that is crucial to examine before evaluating data from Kuwait. Additionally, the limited existing literature on the health of young people in the region will be examined to highlight any key findings that will aid our assessment of urban health indicators in young people in Kuwait.

Chapter 4 (background) will start by outlining a brief historical and demographic description of the State of Kuwait, and its two main cities Kuwait City (a more developed and affluent area) and Jahra (a more deprived city with a large proportion of inhabitants from traditional tribal origins). This will be followed by an overview of the current Kuwaiti health care policy and its focus on the country's youth population in three key areas: overweight and obesity, tobacco smoking and cannabis use, and general mental health.

Chapter 5 (aims and objectives) describes the study aim and objectives as well as the epistemological approach of this thesis.

Chapter 6 (Materials and methods) describes the methodology used in this research to conduct a survey using a standardised questionnaire in a school-based setting on a sample of youths aged 14-16 in Kuwait City and Jahra, Kuwait.

Chapter 7 (Results : First Section) provides a comparison of urban health profiles in young people in Kuwait City and Jahra in five urban health domains as identified through the findings of this thesis.

Chapter 8 (Results : Second Section) focuses on the findings in urban health indicators (UHIs) in youths in Kuwait City and Jahra that are relevant to the current Kuwait Public Health policy, namely overweight/obesity, tobacco and cannabis use, and general mental health (evaluated through elevated risk of psychological distress). In addition to descriptive analysis, the findings in this chapter apply univariate and multivariate logistic regression.

Chapter 9 (Results : Third Section) compares the findings of this thesis in youths residing in the cities of Kuwait City and Jahra with those in 20 European cities in 15 key youth urban health indicators (UHIs) in the EURO-URHIS 2 project.

Chapter 10 (Discussion) summarises the main findings of this thesis and the key differences between Kuwait City and Jahra, as well as the strength and limitations of this study and its approach. Emphasis is placed in this chapter on the three health indicators highlighted by the Government of Kuwait for public health policy.

Chapter 11 (Conclusion) is the final chapter and provides conclusions and recommendations for future public health policy in young people in Kuwait.

Background: Section A: Chapters 2 and 3

Section A: Urbanisation, urban health, and young people in the Arab States.

Section Overview:

Before examining the literature on urban health of young people in Kuwait City and Jahra, this section will review urbanisation, urban health and the health and well-being of young people within the wider context of the Arab States.

This section is divided into two chapters (Chapters 2 and 3). The first chapter concerns the literature on the concept of urbanisation and how it influences, both positively and negatively, the individuals living in a city. It then leads into a brief overview of urban health and previous methods of assessing it, including introducing the EURO-URHIS 2 (European Urban Health Indicators System Part 2) project that provided standardised tools and methodologies adapted for this research. This chapter aims to provide an understanding of challenges young people might face in a highly-urbanised country like Kuwait.

The second chapter will focus on the Arab States given the context for this research and the target population of young people in Kuwait. Although there are differences in income between the countries, the Arab States shares a culture and cultural fabric and it is crucial to understand these before evaluating data from Kuwait [4]. As Kuwait and the region has witnessed rapid urbanisation, it is important to outline the challenges faced by these Arab countries in urban settings and how these are presented in the existing literature.

The second chapter will assess the existing literature on the health of young people in the Arab States to highlight any key findings that will aid our assessment of urban health indicators in young people in Kuwait. One of the most important challenges facing the Ministry of Health in Kuwait is the lack of epidemiological research focusing on young people at a country and city level. This is also seen in the rest of the Arab States. Hence, any

existing research on young people from other Arab countries is crucial to understand the social and cultural aspects in the region and evaluate the urban health profile of Kuwait City and Jahra. This in turn will help to identify specific areas of health inequalities in the region.

2: Urban Health, an Introduction

2.1 Approach to Literature Review:

The approach taken in this research to the literature review, involved an extensive search on of health-focused and medical databases Medline (PUBMED) and utilising the University of Liverpool (United Kingdom) library resources, as well as The Ministry of Health (Kuwait) library in Kuwait City.

Two difference literature reviews were conducted, due to the wide difference between the topics. The first was on “urban health on young people/adolescents” and the second was done for the “Arab States and Kuwait”. Due to the country and region being investigated, the literature was searched in both the English and Arabic language, as the official language in the State of Kuwait is Arabic.

For both topics, expert opinion was consulted in order to identify potential studies or information that would aid in this research. For Kuwait and the Arab States, the grey literature was also examined using the internal database at the Ministry of Information (Kuwait) was reviewed for printed newspapers, magazines, microfilms and other grey literature resources that are not available on the World Wide Web. Access was also granted to the Ministry of Health (Kuwait) filing system database for all official and unpublished data in the State of Kuwait in the health field.

The PRISMA flowchart and protocol were used to conduct the literature review for both topics, these are available in Figure 2.1 and Figure 2.2. The main search terms that were used are available in Appendix A. These were searched in English for topics on “urban health”, both separately and combined with other entries on the list, and in English and Arabic for topics on “Arab States” and “Kuwait”. MeSH Subject Heading search terms were used as applicable. For the literature review on “urban health and young people/adolescents” studies were included from 1995 onwards. For “Arab States” and “Kuwait”, studies were included from 1985 onwards. For both topics, (and, or) Boolean search operators were used, and (not) was not applied.

Figure 2.1 : PRISMA flowchart for urban health and young people/adolescents included in the Literature review

Source : Adopted from Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

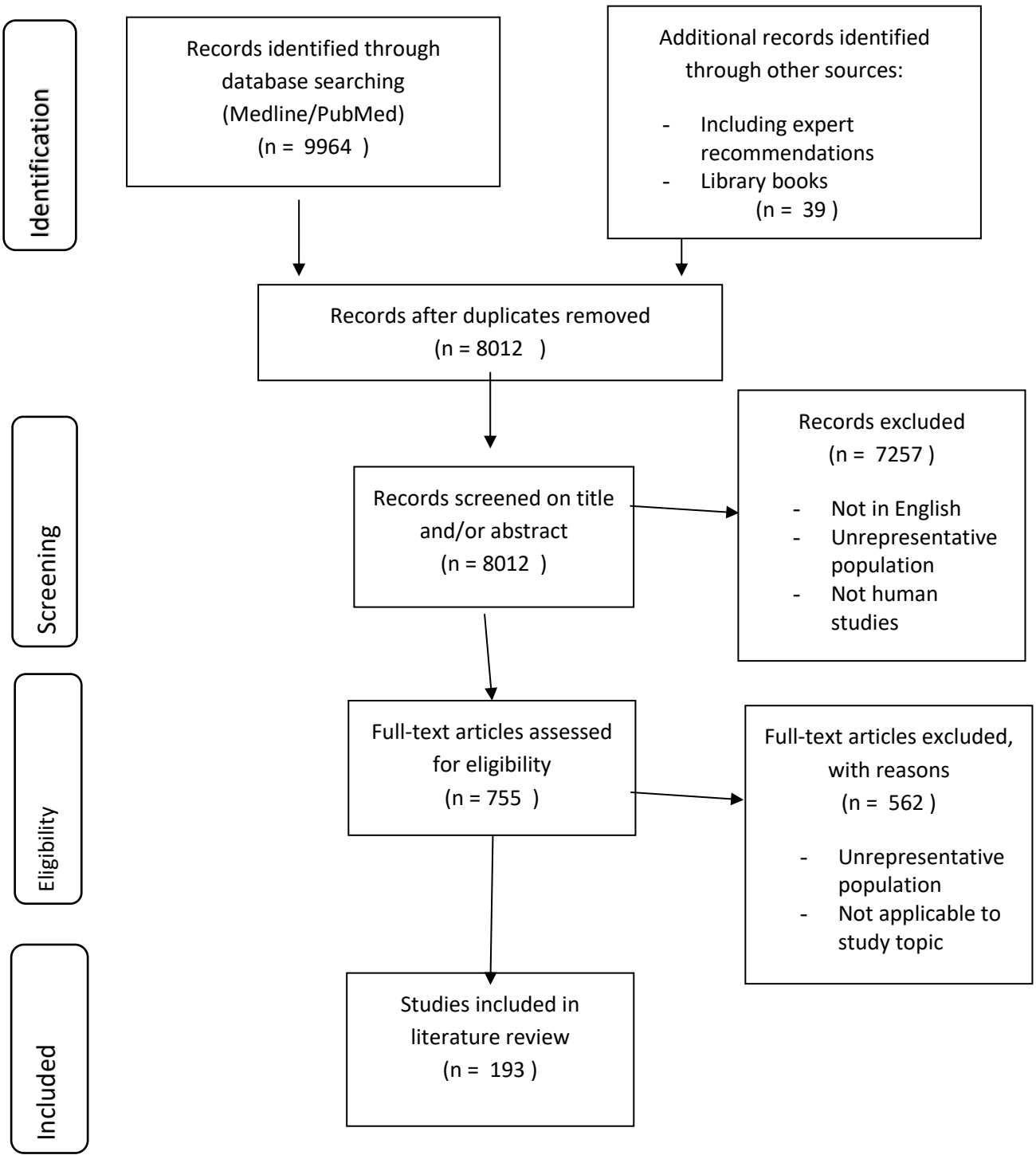
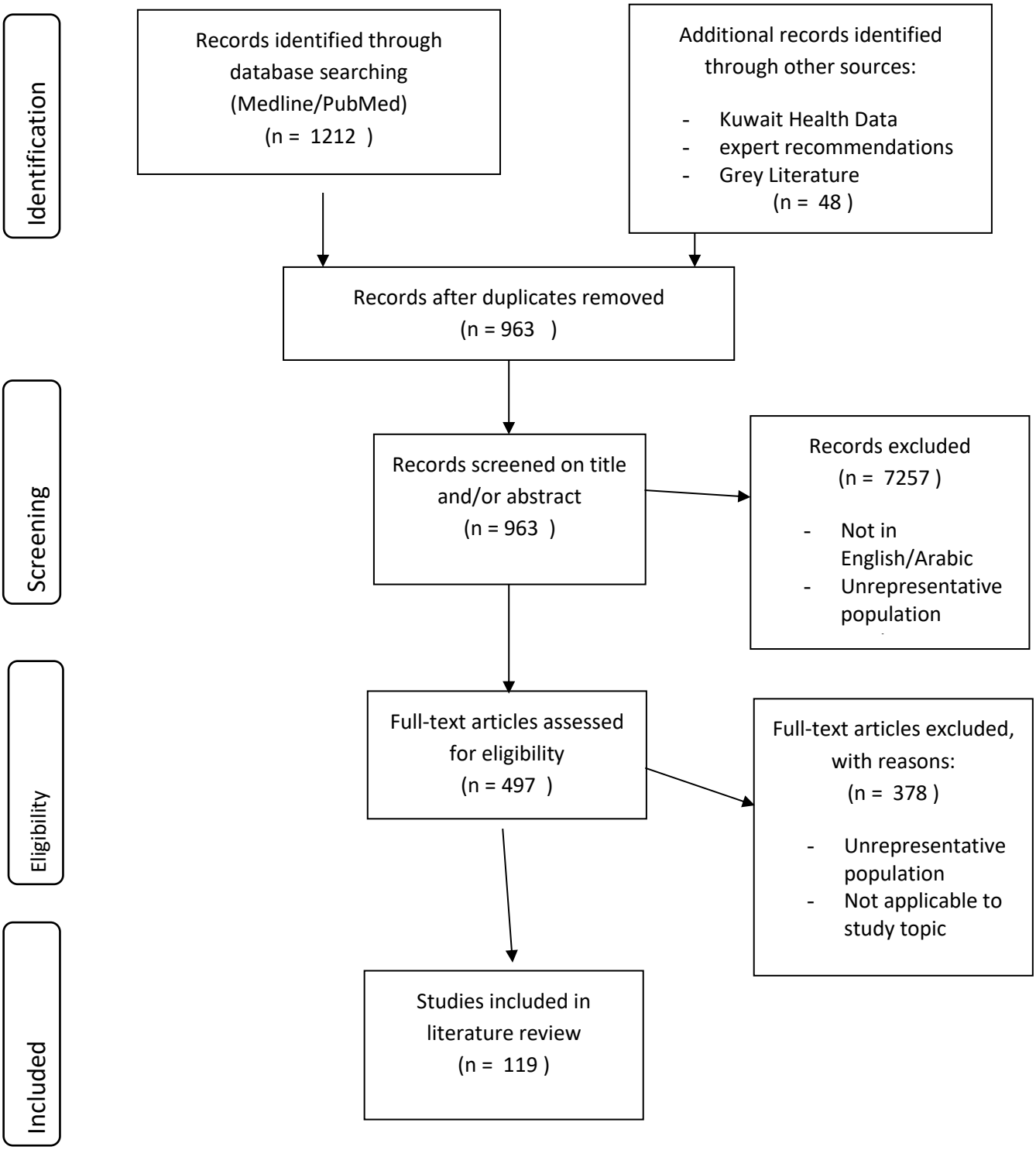


Figure 2.2: PRISMA flowchart for Arab States and Kuwait included in the Literature review

Source : Adopted from Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *P*referred *R*eporting *I*tems for *S*ystematic Reviews and *M*eta-*A*nalyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097



2.2 Urban Populations and The Concept of Urbanisation:

It is estimated that over half of the world's population (almost 3.5 billion) now live in urban areas [5]. The term population is defined as the "total number of inhabitants within a region or country", generally taken at a mid-year, while the urban population refers only to those inhabitants living in urban areas, such as cities [8]. The percentage of individuals living in urban areas on a global level has increased from 29.1% in 1950 to 50.6% in 2010 [6]. This marks an important milestone for humankind, as more people for the first time in history are living in an urban setting, as opposed to living a more "traditional" rural life [1]. During the same time period, high income countries have experienced an increase in their urban populations from 79% to more than 90% [6]. The United Nations Populations Fund (UNFPA) predicts that if current trends continue, by 2030 over 5 billion individuals worldwide will live in cities or towns, with more people living in urban than rural areas in every geographic region [7].

The United Nations (UN) has defined urbanisation as "process" that results in an "increase in the proportion of the population living in urban areas" [9] . The term has generally been used to describe the changes in population size in cities, either by natural growth or by movement of individuals from rural to urban areas, and demographic trends in developed nations in the 20th century [10]. However, with the economic growth trends currently observed in Asia and certain parts of Africa, the issue of urbanisation and its economic, health, environmental and social outcomes are likely to have a more profound global effect. Cities in the 21st century are constantly changing and this in turn could bring about both positive and negative consequences on those that dwell in them and their surrounding vicinities.

2.3 Defining Urban Areas:

There is no single universal definition that differentiates between urban and rural areas at an international level [11]. Instead, countries or regions use different guidelines or criteria to

categorise each of these areas. Many countries rely on parameters such as city population size and population density (usually expressed per square kilometre) to distinguish between urban and rural areas [12].

From a historical perspective, urban areas have been named as such due to the improved or distinct standard of living when compared to rural areas [13]. Despite the growing evidence of the negative impact of urban living, this view still holds importance in developing nations, however a clear-cut distinction is more difficult to make in high income countries [10]. The reason behind this may lie in improved technology, agriculture and modes of transport which have brought rural and urban populations "closer" together [13].

In England and Wales, an initiative by the Department for Environment, Food and Rural Affairs (DEFRA) and the Office for National Statistics developed an "Urban/Rural Definition" in 2004 for use in official governmental statistics [14]. Based on that definition, areas with a population of more than 10,000 registered inhabitants were defined as urban, while those with less than 10,000 inhabitants and with direct access “to the countryside” were considered rural. In the latest Census conducted in the UK in 2011, approximately 82% of the population were living in urban areas in England based on the Urban/Rural definition from a total population of 53 million [15]. Furthermore, while the vast majority of the population in England lived in urban areas, rural areas made up 85% of the total land area of the country [15].

At a European level, the Directorate-General for Regional Policy and Eurostat, through Urban Audit, studied urban areas at three distinct spatial levels [16]:

A) *Larger Urban Zone (LUZ)* - These include the city boundaries and its surrounding areas.

B) *City Level* - based on local political boundaries of that particular city in a selected country
C) *Sub-City District* - Areas within the city level boundaries studied separately as a "sub-city".

The Urban Audit has provided information on numerous demographic indicators in selected European urban areas since 2004 [16]. Roughly 73% of Europeans live in urban regions with Northern Europe being the most urbanised sub-region in the world (84%) [17].

Other geographical regions have different methods of classifying urban and rural locations.

In the United States, “Urbanized Areas" (UA) and "Urban Clusters" (UC) are defined by the Bureau of the Census based on two parameters, namely: population size and population density per square mile [18]. Although areas with a population of less than 2500 are designated as rural by the Bureau of the Census, this issue is not agreed upon by the U.S. Office of Management and Budget. Since different definitions for rural areas are quoted by two governmental agencies in the U.S., the number and proportion of individuals living in these areas can range between 23 and 30% [18]. The US is not the only country that uses lower numbers to designate urban areas, China for example considers settlements with more than 3000 inhabitants as urban (although the term “city” is used for human settlements with more than 60,000 people), and in Uganda, a town with more than 2000 people is considered “urban” [17].

The United Nations Human Settlements Programme (UN HABITAT) in its annual reports has largely focused on studying the economic, social and health impact of urban areas, however in recent publications it has sought to find novel approaches to classifying and further dividing what constitutes a “city” in an urban setting. The rationale behind this is that urban areas in the same geographic region with say 100,000 inhabitants will face different advantages and disadvantages to those living in cities with millions of people [17]. One such approach introduced by UN HABITAT in their 2010-2011 State of the World’s Cities report is the concept of a “city region”, which is a large city that has increased in size to the point that it “captures” other smaller cities and towns, which with time become part of it [17]. An example of this phenomena is witnessed in the Bangkok (Thailand) and Sao Paolo (Brazil) city regions. The same report proposed that this process can occur in smaller cities in different countries, as observed in parts of Europe such as Belgium and the Netherlands [17]. Hence, country borders might not stop the spread of a city region, which could lead to political challenges as well as potential economic, social and cultural collaborations between different countries. Two city regions can be connected by what the UN HABITAT refers to as “urban corridors”, a commercial and transport route of towns and dwellings connecting them together, such as that between the city regions of Riyadh and Mecca in Saudi Arabia[17]. Additionally, if two or more city regions merge together they could form a “mega-region”, however by definition the population of this mega-region has to exceed 20 million inhabitants [17]. An example of this is the mega-region of Hong Kong-Guangzhou-Shenzen in

Asia, with a population of over 100 million [17].

The concept of "urban sprawl", first introduced in the 1950s, commonly refers to the uncontrolled growth of cities as they continue to expand beyond their geographical boundaries [17]. The literature is divided on how urban sprawl (sometimes referred to as horizontal spreading) is viewed, with some proposing it as a beneficial factor in the expansion and economic growth of North American cities [17]. In developed and high income countries, the limitation of affordable living options within a city may result in the formation of "satellite" cities or suburban sprawl (suburbanisation). These generally provide a subjectively attractive option for younger families and the middle class to escape the high living expenses associated with major cities in high income countries [17]. "Satellite" cities and those living in them generally fare better if they are in close physical proximity, and have adequate and affordable access to public transport and communications with a major city. However, recent studies have shown that urban sprawl is becoming increasingly costly, with an estimated annual cost of 400 billion US dollars for the United States alone from its unplanned and unregulated consequences [19]. These expenses are mostly due to lack of adequate or poorly planned infrastructure, transportation, loss of wildlife and agriculture and lack of public services.

With regards to developing nations in the 21st century, unregulated city growth can be haphazard and chaotic causing peripheral settlements (occupied by middle and higher income residents) or illegal slums that lack infrastructure, generally occupied by the poorest in the nation [17]. Slums are defined by UN-Habitat as households in urban settings that "lack one or more of the following: a permanent and durable housing, adequate living space, access to a clean and affordable water source, access to adequate sanitation, and security of tenure" [20] . The proportion of populations living in urban slums has decreased in developing countries from 46.1% in 1990 to 32.7% in 2010 [21]. However, in terms of absolute values, more individuals are living in slums in 2010 than in 1990 in developing countries [21]. Many of these people are driven to live in slums due to economic exclusion and social inequalities associated with modern cities, placing them at risk in a situation they might have little or no control over. On a global scale, approximately one third of all urban populations live in slums accounting for almost one billion individuals [22]. On the other hand, peripheral settlements as a result of urban sprawl, particularly those in developing countries, can have

a poorly defined city centre, scattered low population density and limited road access to major cities and commercial hubs [17].

2.4 Urbanisation and Economic Development:

The complexity of the issues faced by an individual living in an urban area cannot be discussed without fully taking into account economic and social factors brought about by urban living. Individuals in both developed and developing nations might consider moving or residing in an urban area for better opportunities in employment or education [2]. Others consider the choice due to a perceived improvement in access to services, such as health care, education and transportation [23]. Sociologists have linked the social changes that occur in urban settings to the economic driving force of a capitalist market [23]. This could be backed by the evidence that as a country increases in the percentage of urban inhabitants versus rural dwellers, then so does its national per capita income [17]. Cities such as Seoul in South Korea, provide more than 50% of the total country's income [17]. The literature does suggest that cities in the 21st century, regardless of the nations' developmental status, provide a large proportion of a country's wealth [2, 24]. Cities and urbanisation can also have a positive impact on female empowerment and participation in the labour force as well as increasing democratic and social rights for minorities [17].

Even though cities provide considerable income and wealth to most countries and their respective governments, they do not always ensure equity or guaranteed economic inclusion for those living in them. According to UN HABITAT, a minority of city dwellers in developing nations benefit from the huge economic, social and cultural advantages observed in major cities in parts of Asia such as India and China [17]. There is also evidence of negative economic impacts for urbanites in developed countries. In the UK, DEFRA estimates the unemployment rate to be higher in urban as opposed to rural areas, at 3.9% and 1.8% respectively [25]. A similar trend was also noticed in Spain, Latvia, France, Czech Republic, Estonia, and Romania in a study conducted by the European Commission in 2001 for unemployment rates [26]. However, the same study also concluded that this was not

uniform in all European Commission countries, as Slovakia and Lithuania had higher unemployment rates in rural areas [26]. Income inequality between social classes within a city as a consequence of urbanisation is a widespread problem in developing nations but it is increasingly observed in developed countries [17].

While urban living may offer a different and more lucrative lifestyle in the developing world and generates income and revenues to these countries, the majority of their respective populations still continue to live in rural areas. In some developing countries, such as China, there is evidence that urban life can provide individuals with more employment opportunities and higher income [27]. In India, 27.8% of the population is considered urban, while the majority of the population lives in rural areas, which have a higher illiteracy and unemployment rate [28].

Although Africa has seen the largest global rate of increase in urbanisation between 1950 and 2000, from 14.7 to 36.2% respectively, this rate is still lower than that of Asia, where 43% live in urban areas [29]. Eastern Africa is the least urbanised sub-region in the world, with only an estimated 1 in 10 people living in urban settings. Although the literature has linked urbanisation with economic development and growth at a national level in Asia, the Arab States and Latin American Countries, the picture is the opposite for many African countries [17]. Furthermore, the rapid increase in urbanisation in Africa may have generated social inequalities, crime and poverty when comparing urban and rural populations in that region [29]. Maxwell stated that urban issues and poverty (particularly those associated with childhood malnutrition) are neglected in the region and the prime focus of international agencies and the Western mass media is on rural areas in villages, while the overall situation in African cities is worsening [30]. According to the United Nations, the economic growth and the wider gap between urban-rural incomes is more prominent in Asia than in Africa [29]. The reason for these differences are difficult to assess and the lack of census data in many African countries as well as comprehensive studies in the region provides further challenges to understanding this complex situation [31].

2.5 Defining and Understanding Historical Perspectives on Urban Health:

Throughout history the health of individuals in cities has created numerous public health challenges. Freudenberg described the history of public health as "intimately" linked to the history of cities, where one cannot study the former without understanding the changes that occurred in the latter [32]. According to Galea and Vlahov, the term “urban health” can be defined as “the study of the health of urban populations” while its practice includes “a range of clinical, planning, or policy work that aims to improve the health of urban populations” [33]. Henceforth, this particular definition will be used in this thesis when referring to the term urban health.

Prior to the 20th century, most urban health concerns were due to infectious diseases and their spread in densely populated and overcrowded conditions [32]. Public health measures, even though basic at the time, may have played a pivotal role in reducing the burden of several infective agents. An example of this and possibly the origin of 'quarantine' as a concept, can be traced back to Europe and the Middle East during the spread of the bubonic plague between 1300 and 1400, where ships and travellers were isolated for a certain period of time before entering a city [34, 35]. Although the causative agents were unknown back then, the rationale that urban settings crowded with humans such as cities and towns could potentially facilitate the spread of diseases was present. In addition, the decline in mortality from tuberculosis in North America and Europe may have been influenced by public health measures, such as improved sanitation and isolating infected individuals [35, 36]. According to Susser et al., the work of John Snow and his team on the London cholera outbreak of 1854 helped shape the future of epidemiology in urban settings [37].

Other health concerns in European and North American cities in the past included safe water and food transportation and management of human and urban waste products [38]. Historically, these issues were tackled by focusing on the individual rather than addressing the urban environment from a holistic approach [32]. Basic demographic factors still continue to carry an importance today, but changes in the social and economic environment are considered [2].

2.6 Current issues in Urban Health:

A) Urban health, urbanisation and non-communicable diseases:

In 2012, the World Health Organisation (WHO) estimated that non-communicable diseases were the cause of 68% of all global deaths [39]. This estimate represented an 8% increase from the previous figures in 2010 [39]. All of the top three global causes of human mortality were due to non-communicable conditions, namely ischaemic heart disease, cerebrovascular stroke and chronic obstructive pulmonary disease [39]. The gradual shift of morbidity and mortality caused by infectious agents towards non-communicable conditions has influenced the view of what defines a disease, both within the context of urban health practice and in the wider scope of public health. The WHO defines disease as "a failure of the adaptive mechanisms of an organism to counteract adequately, normally or appropriately to stimuli and stresses to which the organism is subjected, resulting in a disturbance in the function or structure of some part of the organism" [40] . Hence, this definition indicates a multifactorial element for the term "disease" and in turn highlights the potential social and cultural aspects that could change the whether a condition is considered a disease or not [40].

In high income and upper-middle income countries, the proportion of mortality attributed to non-communicable causes of disease was approximately 9 out of 10 deaths and 8 out of 10 deaths respectively [39]. Furthermore, 68% of global non-communicable disease mortality occurred prior to the age of 70, resulting in "pre-mature" loss of life that has serious economic and social implications on cities and the communities that live in them [42]. As the number and proportion of city dwellers rise in developing nations, the WHO predicts a gradual increase in mortality and morbidity rates due to non-communicable diseases and a decrease in death rates caused by non-communicable disease by 2030 [43].

Lifestyle factors brought about by urbanisation and urban living are closely linked to many of the health-related risk factors of non-communicable disease, such as overweight and obesity, diabetes, and cancer [39]. Urbanisation and living in a city can bring changes in personal hygiene, income and wealth, modes of transport, dietary preferences, and physical activity [2]. While some of these factors can have a positive outcome on a person's health and

well-being, others can increase the risk of non-communicable disease such as tobacco and excessive alcohol intake, physical inactivity and unhealthy dietary habits. As mentioned above, ischaemic heart and cerebrovascular disease are the two leading causes of death worldwide and in middle and high-income countries [43]. Both these conditions may result from a sedentary lifestyle in an urban setting introduced by the globalisation of unhealthy living habits [42, 44]. The following section will briefly look into three important non-communicable conditions commonly related to risk factors of urbanisation and urban living, namely coronary heart disease, type-2 diabetes, and cancer.

i) Coronary heart disease

As coronary heart disease (CHD), also referred to as ischaemic heart disease, is the leading cause of death globally, there is a need to understand its risk factors in an urban setting, many of which are preventable and pose a public health challenge to cities and policy makers. Coronary heart disease generally occurs when fatty deposits (referred to as plaques) develop within the blood vessels supplying the heart, a process that can occur over years due to a combination of risk factors [41]. Major risk factors for the development of coronary heart disease include : hypercholesterolemia, diabetes, hypertension, tobacco smoking and obesity. There are also other important risk factors of coronary heart disease that are non-modifiable, these are age (older age groups are more likely to develop CHD), sex (males have a higher risk than females) and a family history of heart disease in parents and/or siblings. Other risk factors that are associated with CHD include lack of physical activity, excessive alcohol intake, unhealthy dietary habits (such as low consumption of fruit and vegetables and a diet high in saturated fats) and psychological stress [41]..

The literature suggests that efforts to tackle the risk factors associated with coronary heart disease, particularly with regards to overweight and obesity, should start in childhood [39]. Obesity and being overweight in turn can lead to other illness, for example certain types of cancer, such as breast and colorectal cancer, and type-2 diabetes. Based on findings by Ezzati *et al* in more than 100 countries, population body mass index (BMI) and elevated blood cholesterol levels were correlated with increased national income [2, 44]. However, the same study concluded that in most very high-income countries, both cholesterol levels and

BMI were inversely related to income, particularly in females [44]. Developing countries like India, Cameroon and China have higher obesity rates in urban areas, and much of the same trend is observed in the Arab States [45, 46, 47, 48]. Moreover, in China, there is an increase in childhood obesity in urban settings [48].

In 2014, the WHO estimated that over 420 million people were diabetic worldwide [49]. Differences exist in the distribution of type-1 and type-2 diabetes between some countries and urban and rural areas within them with genetic factors playing a role in this demographic distribution [50]. Lack of physical activity and a sedentary lifestyle have been shown to increase the risk of type-2 diabetes [48]. There is growing evidence that in high income countries, urban living and lifestyle factors associated with it such as overweight and obesity, lack of physical activity and dietary habits can increase the risk of the development of type-2 diabetes. It is estimated that lack of adequate physical activity alone was linked to more than 3 million deaths annually at a global level [42]. In Japan, type-2 diabetes is more common in urban areas than rural [51]. Similar results have also been found in developing nations, such as Iran, China and India [52, 53, 54]. In cities in the US, the prevalence rate of type-2 diabetes is higher in urban areas and in certain ethnic backgrounds within these urban settings (when compared to their rural counterparts), for example Asians, Native Americans, African Americans and Hispanics have a higher prevalence rate than those from a European background [55]. On the other hand, the issue of type-1 diabetes and its link to urbanisation is still a debatable topic. In a study on type-1 diabetes in children in Finland, higher incidence rates were found in urban areas than rural regions, while another in Scotland produced opposing findings [56, 57].

ii) Cancer

In 2015, approximately 9 million deaths globally were due to cancer making it the second highest cause of mortality worldwide [58] . The cost of cancer presents a major global burden due to the high costs of treatment and hospitalisation, particularly on low and middle income nations, with the WHO estimating its annual cost to exceed 1.16 trillion USD [58]. However, it is important to note that approximately half of all cancer cases are preventable and are caused by behavioural and dietary risk factors [58]. Many of these cancers are

associated with risk factors of urban living and urbanisation, such as obesity/overweight, unhealthy eating habits (including low consumption of fruits and vegetables), lack of physical activity, and tobacco use. For example, tobacco use accounts for approximately 1 in 5 cancer mortality worldwide [58].

Screening for cancer and early detection can help improve the chances of survival and reduce the economic and social burden on the individual and society. Some forms of cancer, for example colorectal cancer, can be prevented by early colonoscopy screening [59]. Previous literature has suggested that individuals living in rural areas have less access to health care and screening tests, and are more likely to present with late stage cancer [60, 61, 62, 63]. These findings were observed in urban areas regardless of geographical region and overall country income [17]. While individuals in urban areas may have better access to cancer care than their rural counterparts in the same country, the poorest and lower income groups face considerable barriers when compared to more wealthy residents in the same city [17].

In rural settings, women from ethnic minorities may be the most disadvantaged in terms of access and presenting with late stage cancer [64]. However, late stage cancer was not found to have a higher incidence in all rural settings and the picture could be different in some high income countries. For example, in Illinois in the United States, four types of cancers at a late stage (colorectal, lung, breast and prostate cancer) were found to have a higher incidence rate for urban cities compared to rural regions [61]. Other studies in high income countries have found no urban-rural differences and consider low income and/or socioeconomic status to be the main factor in late-stage presentation [63, 64, 65, 66]. In terms of cancer mortality differences, higher mortality rates are seen in rural areas in low and middle-income countries, for example Lithuania, China and Mexico [67, 68, 69].

The literature on cancer incidence rates does not present a clear cut direct urban or rural "disadvantage", instead it links associated risk factors of urban living to the overall cancer incidence in a region or country [61]. This review has found some examples for difference in incidence rates between rural and urban areas within the same country. For example, in Egypt, women in urban areas were more likely to develop breast cancer than rural women (RR= 3.73, CI 95% CI= 3.30 - 4.22) [70]. Similar rural-urban differences for breast cancer were noted in Poland [71]. The reasons for why this might happen are still unclear.

B) *Communicable diseases in Urban Areas:*

While in the West and high-income countries, the negative health impact of urban living is generally linked with non-communicable conditions and their associated burden, infectious diseases still present a major health concern for urban areas in developing nations. Nevertheless, the perils of infections should not be neglected in developed nations, specifically with the growing risks of emerging and re-emerging diseases and the role that modern cities play in their distribution. Cities in the 21st century have a pivotal role in monitoring infectious disease trends and epidemiological surveillance as well as ensuring adequate childhood immunisation coverage for its inhabitants.

The UN defines climate change as "global warming due to greenhouse emissions from human activities" [9] . Global climate change presents cities with new public health concerns in combating microorganisms, insect vectors and their reservoirs. One such example of this is the detection of malaria, a parasitic vector-borne disease that cannot be passed from person to person, in previously non-endemic urban areas with the absence of recent travel history [72]. The WHO predicts that climate change could bring about a 5% increase in global malaria cases if average temperatures rise by only 2°C [72]. This is because increasing temperatures and/or prolonging the summer season would provide optimal conditions for vector breeding, bite rate and spread of this tropical disease in endemic areas as well as promote the ecological and environmental conditions necessary for the mosquito vectors to survive and reproduce in new geographical locations [72]. Similar scenarios associated with climate change may also be observed with other parasitic infections, such as dengue fever, yellow fever and zoonotic infections, such as Lyme disease, all of which could have an impact on cities and urban living [72].

The challenges of emerging and re-emerging infectious diseases necessitate high income countries to operate and ensure constant surveillance and monitoring. In the UK, a total of 9040 cases of tuberculosis (TB) were reported in 2009, with higher rates occurring in urban areas [73]. In the same report, London had the highest incidence rate of TB at 44.4 per 100,000 (95% CI 42.9-45.9) and overall UK rates are close to those reported in the 1970s [73,

[74]. Resistant strains of tuberculosis have resulted in a burden on medical services in developed urban cities in the past two decades [75]. In California in the United States, a study showed a statistically significant increase from 7% in 1993 to 32% in 2005 in TB resistant strains to commonly used antibiotics isoniazid and rifampin [76]. Other locations with a high prevalence of multiple drug resistance strains of TB include urban areas in Russia, Argentina, and parts of South East Asia [75]. With immigration usually occurring from developing to developed countries, surveillance is required in urban areas in high-income countries to help overcome this growing problem. However, immigration alone is not the only factor that should be considered in the case of TB in urban settings, as cities with large populations such as London provide an environment that facilitates the spread of the bacteria through close contact in public transport and overcrowded living conditions [75].

Lower respiratory tract infections are relevant for both high-income and low-income countries, as they were the sixth and first cause of death respectively [39]. An important contributing factor to lower respiratory tract infections is the influenza virus, which causes considerable mortality and morbidity as well as co-morbidity with bacterial pneumonia. Epidemics of the virus can carry a substantial economic cost on cities, whether by increasing the utilisation of healthcare services or loss of labour force participation through absence and sickness [77]. Young children, elderly and those suffering from chronic conditions that reduce or alter immunity like diabetes, cancer, heart, lung, and kidney diseases, are considered high risk groups. Individuals living in urban areas with a high population density, such as slums, are at an increased risk of acquiring the influenza virus [78].

The Global Influenza Programme (GIP) set up by the WHO has stressed the role played by cities and other urban settings in organising public health measures to monitor and control the risk factors associated with the influenza virus [79]. Seasonal influenza (influenza virus A and B) still remains the main burden with respect to mortality and morbidity and economic costs associated with the virus, however it is crucial that emerging strains, such as avian flu, are not neglected. This is due to the fact that they have a higher case fatality rate but exhibit a similar clinical picture and spread in the same urban conditions as that of seasonal influenza virus [79].

In 2005, mortality due to communicable diseases accounted for over 12 million deaths

worldwide, the majority of which occurred in developing countries [43]. In low-income countries, approximately one third of all deaths are attributed to communicable disease [39]. Bacterial and viral disease contribute to high mortality rates in urban areas in developing nations, particularly poorer regions or so called "slums" [21]. All the previously mentioned characteristics of slums could in turn promote the spread of communicable diseases, either directly or indirectly. In addition, overcrowding is common in slums promoting communicable respiratory conditions, such as tuberculosis and the influenza virus, through droplet infection. Not only are developing regions facing a similar problem with infectious diseases to that which was encountered by Europe and North America in the 1800-1900s, but the fact that many urban cities in these nations lie in tropical climates further promotes the spread of infectious diseases [32, 81]. Along with infections of the digestive and respiratory tract due to bacteria and viruses, parasitic infections are common in many developing cities due to temperate climates [81]. Infectious diarrhoeal diseases are one of the top ten causes of death globally, with the vast majority of the annual 1.5 million deaths being children [82]. In low-income countries, these still occur in urban settings, and are more predominant when social inequalities and barriers to healthcare exist.

Another communicable disease that is of importance in urban settings in both developing and developed countries is HIV. Mortality due to HIV/AIDS in 2012 in low-income and lower-middle countries was the second and seventh commonest cause of death respectively, where access to highly active antiretroviral therapy (HAART) can be limited [43, 82, 83]. In parts of Africa, for example Uganda, South Africa, Rwanda and Tanzania, studies have found that HIV/AIDS prevalence is more common in urban settings compared to rural areas [84, 85, 86].

In high-income countries, mortality and incidence rates of HIV/AIDS are lower than low-income and middle-income countries [43]. The epidemiology of transmission for HIV/AIDS in high-income countries can depend on the region [87]. However, in many cities and towns in developed countries, high risk groups continue to include commercial sex workers, intravenous drug users and their partners, and men who have sex with other men [87, 88]. In cities in Western Europe, there has been a recent increase in heterosexual infection, especially in migrants born in countries with high HIV prevalence [87]. Furthermore, HIV/AIDS can carry a huge economic burden on cities by increasing health care expenditure on treatment and care costs for its sufferers and the system [89].

To address the problem of AIDS/HIV in cities and towns, the United Nations Human Settlements Programme (UN-HABITAT), through its Urban Management Programme (UMP), developed an initiative to form partnerships with local governments [90]. The initiative addresses HIV/AIDS by encouraging public health measures at a local level [90].

C) *Environmental Urban Health:*

The physical environment surrounding city dwellers can have a positive or negative impact on their health. The term "urban physical environment" can be defined as "the built environment, air and water quality, noise levels, parks, and climate conditions in cities" [33]. Environmental factors, such as air pollution, asbestos and radon exposure, and water sanitation are some of the key issues addressed by the WHO in urban areas and cities [91]. According to the WHO (Regional Office of Europe), environmental factors account for approximately 24% of all diseases, most of which can be reduced by preventable measures if cities take action [92].

Air pollution from motor vehicles has been documented to cause morbidity and mortality, particularly in crowded and lower income areas of cities [38, 93]. In 2005, the WHO estimated that two million deaths are caused by air pollution annually [94]. An epidemiological study from Japan found that long term exposure to air pollution increased the risk of mortality from cardiovascular disease and the incidence rate of lung cancer in non-smokers [95]. Similar findings of increased mortality due to short-term outdoor air pollution were documented in urban areas in Indonesia, Germany and China [96, 97, 98]. The current levels of air pollution in the UK are not within the air quality guidelines set by the European Union (EU) and can potentially cause mortality, particularly in urban areas, mainly due to levels of PM_{10} and O_3 [99].

In cities in low-income countries, indoor air pollution is a serious health concern as millions of people still depend on using biomass (such as wood and coal) for domestic needs [38, 100]. Health effects of indoor air pollution due to burning biomass include chronic obstructive pulmonary disease (COPD), childhood acute lower respiratory infections, ischaemic heart disease, stroke, lung cancer, increased risk of tuberculosis and increased risk of cataracts [101].

In the future, climate change may have a huge impact on cities, particularly in the developing world [102]. An increase in average temperatures can bring about a change in the epidemiology and distribution of communicable disease, which has been discussed in the previous section. Furthermore, heat waves may result in water and food shortage or limit the access to sanitary water supplies in many cities [102]. According to the WHO, most future projections in urban areas do not consider climate change and could result in different trends if assumptions were included [102].

D) *Mental health, alcohol and substance abuse in urban areas:*

Living in an urban area can have an impact on a person's mental health and social well-being. Mental health is mentioned in the widely recognised and broad WHO definition of health, as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [103] . The term "mental health" itself is defined by the WHO as "a state of well-being in which every individual realises his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community" [103].

One of the most important conditions in mental health is depression. According to Ross et al, adult depression occurs more commonly in deprived urban neighbourhoods [104]. Depression is not the only mental health condition to be observed in cities, as numerous studies have linked schizophrenia to urban living [105, 106, 107,108].

Urban and rural populations in the same country and/or geographical region address and cope with mental and social problems differently [109]. In a study on self-reported stress in adolescents, urbanite males reported more conflict of interest and external expression of stress than rural males [109]. A case-control study in Canada on children and young adults also found that being born in rural communities may have a protective effect over those who were born in other parts of the country, and being less likely to be diagnosed with depression or acute reaction to stress [110]. Social isolation has been linked, particularly in older adults, to urbanisation [111]. Additionally, older urban adults in the US expressed more

positive attitudes towards the use of mental health services than their rural counterparts even when income was taken into account [112].

Most countries have higher suicide rates in urban areas than rural [113, 114]. This has been observed in high, middle and low-income countries.. Interestingly, a study has found that urban settings may increase suicide rates in females and significantly decrease suicide rates in males when addressing confounding factors such as marital status and income [113]. Regarding ethnic minorities and suicide, first generation minorities in Sweden have higher rates of suicide than their country of origin [117, 118]. The literature does suggest that social isolation and poverty play a role in suicidal rates in high and middle-income countries [17].

Substance abuse and misuse has been closely linked to antisocial behaviour, accidents and mortality in cities in both high income and low income countries [119, 120]. The WHO estimates that alcohol accounts for 3.3 million deaths per year and a third of all injuries and accidents, most of which are based in urban settings [120, 121]. In England and Wales, higher rates of alcohol-related mortality were observed in urban areas for both males and females [122]. Other studies have also found similar urban-rural inequalities, with alcohol and drug dependence being higher in urban areas [105, 123]. Over 65% of mortality from drug overdose in New York City was attributed to poverty and lower socioeconomic status within the city [120, 124]. However, Paykhel *et al*. suggest that income and SES alone do not explain the rural-urban differences in substance abuse and other factors in the social environment connected to urban living and urbanisation may play a part [105].

Data on smoking from Europe and China has shown a higher prevalence in urban areas than rural, with a larger urban-rural difference in women [125, 126]. As cigarette smoking and tobacco use represent a major public health concern in Kuwait and the Arab States States, its implications and trends in young people will be discussed in more detail in Chapter 3 and 4.

2.7 World Health Organization: International and Regional Initiatives Addressing Urban Health

A) Healthy Cities and the WHO Commission on the Social Determinants of Health:

Many international and regional agencies and organisations, as well as smaller community efforts, have tried to focus on the health and determinants of health in relation to the urban context [127].

Focusing on urban health is not a recent health promotion target by the WHO. It has existed as a priority since the late 1980s. The original interest was driven by proposals and initiatives that changed the understanding of "what is health" and how it was viewed, including the Declaration on Primary Health Care at Alma-Ata (1978), Health for All (1984) and the Ottawa Charter of Health Promotion (1986) [17]. In 1987, Phase I of Healthy Cities was initiated by the WHO European Healthy Cities Network through their European Regional Office by 35 cities [131].

An important initiative occurred in 2005, when the Commission on Social Determinants of Health was established by the WHO to facilitate the understanding of the social determinants of health and help countries address them at an inter-city and intra-city level [132, 133]. Based on a report issued by the Commission in 2008, the WHO passed a resolution in 2009 entitled "Reducing health inequities through action on the social determinants of health". According to the WHO, efforts to tackle health inequities must target those most disadvantaged, narrow the health gap between different socioeconomic status groups, and reduce health inequities for the whole population [132, 133].

The WHO defines a healthy city as "*one that is continually creating and improving physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life, and in developing to their maximum potential*" [134]. This further consolidates the notion that for a city to be "healthy" it should consider the social determinants of health and operate through an equity lens.

In 2009, the Healthy Cities project reached Phase V with a total of 90 participating cities, and targeted a five-year goal of health equity and promoting "heathier" urban design [135]. A study evaluating the WHO Health Cities programme in Germany during 1999-2002 reported that since its implementation the German Healthy Cities Network has expanded and developed even with limited resources [136].

In 2010, the WHO through its Centre for Health Development (Kobe Centre, Japan), chose urban health to be the theme of its World Health Day, entitled "1000 Cities, 1000 Lives" [128]. Through this campaign, the WHO addressed the growing problems attributed to urbanisation and urban living and their effects on health by collaborating with governmental and private organisations to encourage and promote healthy living [129].

Participating cities were encouraged on the 7th to 11th of April 2010 (the week of World Health Day) to actively promote healthy lifestyles through opening parks and improving access to green space for the public, limiting road travel to encourage physical activity and reducing air pollution, and organising events promoting the concept of urban health to their inhabitants. Open-street events, a concept popular in Southern and Latin American countries, were organised in selected cities due to their previous success in several Columbian cities in increasing physical activity [22]. The campaign encouraged local communities within participating cities to take part in volunteering in health promotion and health education programmes, stressing active involvement. Important areas of focus for this campaign were urban slums, mental health and health inequities in urban areas [129]. Also within the same proposal, the WHO called for policy makers in cities to ensure adequate urban planning, particularly in developing nations, to reduce the health effects associated with rapid urbanisation and urban sprawl [129].

The guidelines for "Healthy Cities Networks" have gradually changed from a European concept to a global one. For example, similar principles form the basis of "healthy cities" in California and other cities in high-income countries have tailored their guidelines based on the needs of their city dwellers [137]. Currently, Healthy Cities Networks operate in more than 1000 different cities in all WHO regions with Phase VI (2014-2018) underway in 66 European cities [138]. The main objective of phase VI will focus on uniting stakeholders and promoting leadership towards overcoming public health issues in urban settings [139].

B) WHO Urban HEART:

Urban HEART (Urban Health Equity Assessment and Response Tool) was developed by the WHO as a tool to study urban populations with an emphasis on health inequities. It is crucial to note that Urban HEART was developed as a policy focused tool and not an epidemiological tool. Due to this fact, it will be covered only briefly in the section below. It provides a tool for studying health inequities at an inter-city and intra-city level. Urban HEART was first piloted in 2008-2009 in 17 cities across 10 countries with a focus on local authority participation and an inter-sectoral approach with the intention of empowering communities [132]. The Urban HEART user manual provides a checklist to help organise teams, organisations and other stakeholders needed for the inter-sectoral approach.

The assessment segment of Urban HEART is divided into two main components, with examples of core indicators mentioned in brackets [132]:

A) Health outcomes, which are further divided into:
   i) summary indicators (e.g. infant mortality rate)
   ii) disease specific mortality and morbidity indicators (e.g. tuberculosis, diabetes, and road traffic accident rates)

B) Social determinants of health, which are divided into:
   i) Physical environment and infrastructure (e.g. access to safe water and sanitation)
   ii) Social and human development (e.g. primary school completion, skilled birth attendance, prevalence of smoking and childhood immunization)
   iii) Economics (e.g. unemployment rates)
   iv) Governance domain (e.g. government spending on healthcare)

Local authorities and their partners were given autonomy to select indicators based on their intra-city needs and the Urban HEART manual refers only to recommendations outside the core indicators mentioned above [132]. Hence, one of the disadvantages of WHO Urban HEART is that there must be government participation and interest along with

financial backing from cities to achieve the desired results from the tool. Finally, while urban HEART was developed as a policy focused tool to evaluate health equity in urban settings, it was not an epidemiological tool designed specifically to assess indicators of urban health.

2.8 Urban Health Indicators:

Can Urban Health be measured?

Often the literature on urban health recognises an "urban penalty" or "urban health penalty" in describing the communicable and non-communicable diseases and conditions that occur with urbanisation [2, 140]. When addressing the notion of an "urban health penalty", urban slums and the health and living conditions of low income households are applied to strengthen the argument [141]. However, other studies also address an "urban advantage", particularly seen when studying infant mortality rate trends and their corresponding decrease with urbanisation in developing nations [2, 142]. Vlahov *et al* explained this advantage by the proximity of resources in cities that ultimately could benefit the poor and improve overall urban health [24]. Furthermore, Allender *et al*, suggest that urbanisation should be referred to as a process instead of a rural/urban dichotomy to understand concepts and risk factors in chronic diseases [10]. To further understand urbanisation and urban health, one has to look into intra-city differences instead inter-city ones, particularly those between the wealthiest and poorest neighbourhoods.

The concept of an “urban divide” within a city is well recognised in the literature [17]. This occurs when there are clear economic, social, cultural and/or political differences between the wealthy and poor residents of the same city [17]. An urban divide could potentially lead to a “health divide” and a “social divide”. Hence, an urban divide can present different intra-city indicators and risk factors associated with urban health, based on social class and income. An urban divide, particularly in high-income countries, may not present in a clear cut division of “slums vs affluent districts” as seen in cities in middle-income countries such as Brazil and Argentina. For example, some neighbourhoods in Glasgow, Scotland differ by more than 25 years in life expectancy compared to more affluent areas in the country [22].

Studying or tackling urban health or attempting to measure urban health indicators cannot be achieved without understanding the social determinants of health.

A “divided city” generally fails to provide its poorest inhabitants with the means to achieve economic and social inclusion and increases health and social inequalities [17]. To further evaluate how cities can influence the health of their inhabitants it is important to understand the concepts of “health inequalities” and “inequities”. The term “health inequalities” can generally be defined as “differences in health status or in the distribution of health determinants between different population groups” [143] . On the other hand, health “inequities” can be described as unfair or unjust differences in health between different groups that can be avoided or corrected [144]. Examples of this would be differences in terms of health status in the same urban area between groups based on ethnic background, sexual orientation, or religious belief [144]. As the study group for this thesis was young people aged 14-16 years in Kuwait, intra-city and inter-city health inequities carry importance when taking into account the surrounding environment and neighbourhood they live in with their families, as discussed in Chapter 4.

As cities fail to provide economic and social inclusion for all their inhabitants, this can lead to cultural as well as political exclusion [17]. Social divisions within a city can prevent certain groups accessing to equal opportunities based on age, gender, sexual orientation and ethnicity. According to Wilkinson and Pickett, continued economic growth, especially in rich countries, will not provide a substantial improvement in the overall health and well-being of the individuals living in them [145]. It could be argued that evidence of this is seen when comparing the relatively small difference between life expectancy in the United States with that of Greece and Japan, both of which have a considerably lower average per capita income compared to the United States. Instead of focusing on increasing a country or cities economic wealth, policy and public health efforts should focus on reducing economic inequalities. There is growing evidence that unequal societies face more health issues in several public health issues, including mental health, obesity, drug use, as well as young people’s health and their social well-being. Furthermore, inequalities could increase the lack of trust between different members of society based on their social standing [145]. There appears to be evidence that efforts to reduce income inequalities improve the health and well-being of all groups in the social hierarchy in a country, whether they are rich or poor

[145]. Additionally, tackling income inequalities can also bring about improvements in the physical environment, and in turn giving benefit to all, irrespective to their position in the social ladder [145].

Gender inequality between women and men in developing nations is evident and women still continue to face more problems in access to education [17]. Moreover, even in situations where men and women have the same educational level, women on average earn less income in the same urban area, sometimes even when they hold higher degrees than men [17]. In many parts of the world, patriarchy still exists as a social system, and this places young girls at a disadvantage in access to both health and education as compared to boys. Patriarchy and gender inequalities and their association with urban health indicators have historically been linked in the Arab States, and still continue to present in the region to this day. Their significance for young girls in the region and in Kuwait City and Jahra in particular will be discussed in more detail in Chapter 4.

Social segregation can exist within a city even without the presence of racial or ethnic factors, such as the case of the Bidoon in Jahra, Kuwait, which will be discussed in detail in Chapter 4 [17]. In turn social segregation presents new public health challenges to local health authorities, including limiting access to healthcare facilities to those affected.

Efforts to tackle the concept of the "urban divide" exist and focus on transforming a city from a fragmented one into what is referred to as an inclusive city. According to UN HABITAT, inclusive cities have to accommodate all their inhabitants in four key dimensions: social, political, economic and cultural inclusion [17]. Inclusive cities can improve quality of life, democracy and growth and prosperity if all four dimensions are acknowledged. Brazil is the first country to introduce the concept of the "right to the city" in its constitution, where all citizens regardless of their social and economic status, have equal rights and space in the city.

2.9 European Urban Health Indicators System:

The concept of identifying a system for measuring and comparing various indicators of urban health at a European level was first proposed in the EU Public Health Programme in 2005 [146]. In 2006, initial work was started at the University of Manchester to develop a tool

for monitoring urban health [147]. In the first step of this project, entitled EURO Urban Health Indicator System (URHIS) 1, an assessment was made of which European Community Health Indicators (ECHI) were relevant and applicable to urban health [148]. These indicators were divided into four main groups: "demographic and socio-economic", "health status", "determinants of health", and "health interventions: health services" [149]. This was achieved through a course of ten Work Packages (WP) as shown in Table 2.1.

Table 2.1: Work Packages in the EURO-URHIS 1 project (2006-2008) [150]

Work Package Code	Description
WP1	Coordination of the project
WP2	Dissemination of results
WP3	Evaluation of the project
WP4	Literature Review and Appraisal
WP5	Definition of Urban Areas and Populations
WP6	Questionnaire Development
WP7	Data Collection
WP8	Country Summary Reports
WP9	Development of policy impact indicators
WP10	Description of Urban Health Indicator system

At WP4, a draft of 55 urban health indicators (UHI) were identified [147]. This draft list of UHI, called EURO-URHIS 55 at the time, was piloted in 2007 in four European countries, the UK, the Netherlands, Germany and Greece as part of WP6 [147]. Following the pilot, these UHI were narrowed down to a total of 45 UHI and the questionnaire was labeled as EURO-URHIS 45 [147]. From April until December 2007, data collection was carried out in 60 European

Areas in a total of 30 countries using the EURO-URHIS 45 questionnaire [147]. In WP10, the UHI were further reduced to 39 UHI that formed the basis of the Urban Health Indicator System and EURO-URHIS1 ended by achieving its set objectives [147].

In 2009, EURO URHIS 2 was developed to collect data from heterogeneous European urban areas and to provide methods for assessing and comparing the health of different urban populations [150]. It also aimed to produce validating cross-sectional tools for studying existing data and for future policy from 30 cities in 12 European countries [150, 151]. As this research in young people in Kuwait City and Jahra, Kuwait is part of the larger EURO-URHIS2 project and has closely followed the methodology and a translated version of its youth survey, this topic will be covered in more detail in Chapter 6 (Materials and Methods) of this thesis.

3: The Arab States and its Young People

3.1 Overview:

As the State of Kuwait is situated in the region of the Arab States and essentially considered an Arab country, it is important to briefly mention the specific cultural and political dynamics and public health concerns of this geographical area with an emphasis on young people and their health and well-being. Furthermore, the first article of the Kuwaiti Constitution states that the people of Kuwait are "*part of the Arab States*" [154]. The Arab States not only shares a common official language (Arabic) but it also has a distinct cultural and social fabric that should be taken into consideration before focusing on Kuwait and its two main cities, Jahra and Kuwait City, and their respective youth populations.

Many of the cultural and social characteristics of the Arab States are shared in the communities of this region irrespective of religious belief, socioeconomic status, and geographical borders. Moreover, rapid urbanisation has presented its youth population with their own unique public health challenges that may differ from other geographical regions. Although the region as a whole shares many inter-country values and similar governmental hierarchy and structure, there are important intra-country differences between the Arab states that need consideration and will be briefly discussed in this chapter. Historically, the Arab region has been known for strong family cohesion, hospitality and integrated networks of informal community-based social support [4, 155]. These cultural factors have witnessed changes with urbanisation and modernity, which could in turn effect the development and social integration of young people in the region.

Crude oil and natural gas resources carry a significant importance to the economy and development of the Arab states, and play a major role in the history and economy of Kuwait and most of the region. As much of the Arab States is arid land (estimated at over 80%) with scarce natural water supplies and an increasing dependency on sea-water desalination plants, urban planning carries an additional cost and risk [4]. All these factors place an increased burden on public health officials and require Arab governments to carefully plan

resource allocation.

The Arab region as a whole suffers from a lack of data in the field of public health and health-related census data. Urban and public health data allowing comparison of health attributes both within and between cities within Arab states is scarce and where available is dated and not relevant to current urban contexts. Studies on the health of young people have been few and far between and the limited existing research has focused chiefly on the extremes of life; the very young and elderly. As mortality and morbidity commonly occur at infancy and old age, the existing research in Arab states has primarily focused on these demographics with limited research on the health and well-being of young people.

Adolescents and young adults aged 15-24 years make up roughly one third of the population of the Arab States and approximately 60% of Arabs are under 25 years old [4]. This is commonly referred to in the literature as the Arab States "youth bulge" [4]. While the median age in the State of Kuwait is higher than the median age in Arab States, at 28 years and 22 years respectively, it is considerably lower than the European median age, at approximately 42 years [4].

3.2 The Arab States as a concept:

Arab StatesIn this thesis, the term "Arab States" will be used consistently to describe a group of countries, which Kuwait is a part of, that share a similar language, as well as a distinct cultural and social identity. While the term "Middle East" is commonly used in the literature to refer to the Arab countries, from a geographical perspective it also includes countries such as Iran and Turkey, which would not fit in that classification [4]. Furthermore, some Arab countries, for example those situated in North Africa, could be considered outside the geographical boundaries of the Middle East. This makes the use of this term unsuitable if the desired focus is to further understand the social and cultural fabric and public health concerns of young people in the Arab countries.

"Arab states" is used by several governing bodies within the UN, including the United Nations International Children's Emergency Fund (UNICEF) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO), to refer to countries that use the

Arabic language as a first language [4]. Within the World Health Organisation (WHO), Kuwait and most of the Arab countries are in the regional office of the Eastern Mediterranean Region (EMRO) with the exception of 3 Arab countries. Furthermore, the EMRO includes countries that are not Arab states (for example Afghanistan). Hence, the dependence on existing EMRO health data alone will not provide the full picture to understand the health and well-being of young people in the Arab states.

In this research, the term "Arab States" will be used based on a country's membership to the League of Arab States. This League, formed in 1945, which currently includes 22 member states located in the continents of Asia and Africa, accepts members that have Arabic as their official state language [4]. The League's head office is in Cairo, Egypt and has the role of addressing economic, social and cultural affairs between Arab states, as well as public health challenges for members of the region as a whole. The total population when including all member states is approximately 400 million [156]. While most of the inhabitants in the Arab states are Muslim, large Christian communities exist in Egypt, Lebanon, Syria and Iraq. According to Jabbour et al., studying public health in any Arab states within the context of the social determinants of health and through an equity lens can only be achieved through understanding the cultural and social background of the Arab States [4]. Hence, reviewing existing data and public health measures in the countries of the League of Arab States is essential to understand the current health situation of young people in Kuwait City and Jahra.

3.3 Classification of the Countries within the Arab States:

There have been several attempts at classifying and dividing the members of the Arab League of States. The first and the most common in the literature is to divide them into sub-regions based on a combination of geographic location and socio-economic status of individual countries (see Table 3.1). In this division, Kuwait is considered part of the Gulf Co-operation Council Countries (GCC), a group of six Arab states situated between the Persian Gulf on the East and the Red Sea on the West with abundant resources of crude oil and natural gas. The term "Least developed Arab States" (LDAC) is used in the literature to refer

to countries like Yemen and Djibouti, where extreme levels of poverty are present [4]. Another method of classifying the countries has been through their economic and labour force abundancy. For example, the United Nations Development Programme has divided the Arab states based on the abundance of resources and the size of the labour force. This has divided the countries into three different types:

1) Resource rich and labour force abundance – such as Iraq
2) Resource rich and labour force poor – such as Kuwait and other GCC countries
3) Resource poor and labour force rich – such as Tunisia

Other less commonly used methods of classifying countries include dividing them on the ground of the presence or absence of conflict.

Table 3.1: Classification of Arab States with Kuwait as part of the GCC countries [4].

GCC Countries	**Maghreb Countries**	**Mashreq Countries**	**Least Developed Arab Counties**
Kuwait	Algeria	Egypt	Comoros
Bahrain	Libya	Jordan	Djibouti
Oman	Morocco	Iraq	Mauritania
Qatar	Tunisia	Lebanon	Somalia
Saudi Arabia		Syria	Sudan
United Arab Emirates		Palestinian Territories	Yemen

3.4 Recent History of Public Health and Healthcare in the Arab States:

The history of public health in the cities of the region goes back to hundreds if not thousands of years. However, the basis of current public health policies and healthcare systems can be traced to the period following colonialism in the 1950s and 1960s. While several Arab countries gained their independence during that period through war and conflict, such as Algeria, others were governed through mandates and agreements between European powers and local leaders, as in the example of Kuwait. The literature suggests that in both examples, colonialism had a negative impact on the health of the inhabitants of the region [4]. According to Tabutin and Schoumaker, infant mortality rates (IMR) in the Arab countries immediately following independence were much higher when compared to Europe between 1950 and 1960 [157]. During that period, it was estimated that the IMR in Kuwait was 80 per 1000 live births with the range for the region between 60/1000 and 180/1000, in Lebanon and Egypt respectively. Life expectancy at birth was found to be low as well, with most countries estimated below the age of 50 [4]. Kuwait at that time faired only slightly better in terms of life expectancy at birth, at an average life expectancy of between 55 and 60 in the 1960s [157]. This could have been linked to the discovery of oil as a new form of revenue for the country, which will be discussed in more detail in the next section (Chapter 4). Additionally, Kuwait was the first country in the region to implement free healthcare for all its inhabitants in the 1950s, followed by similar models in other countries in the region.

Apart from Lebanon, which has had a predominantly private-owned healthcare system since the 1950s, and to a lesser degree Jordan, the rest of the Arab states at the time of their independence were largely state-run and socialist healthcare systems. There is evidence that the concept of “Arab unity” through the Arabic language and a shared culture was used as a medium to bring people from different races and ethnicities together, particularly in the early years of independence for these states [4]. In that period, new constitutions were written in most Arab countries in which health was viewed as a “right” and it was obligatory for the state to provide healthcare for its citizens [4]. Whether this was due to public demand following colonialism or the active role of health professionals in the uprisings at that time is

debatable, although these events should be viewed in the patrimonial and authoritarian environment that existed and continues in many Arab states to this date. In the Kuwaiti Constitution written in 1962, article 15 states that "*The government has the obligation of protecting the public health of its citizens and the means of preventing and curing disease and epidemics*" [154]. The current structure of the Kuwaiti healthcare system, as well the working healthcare policy is covered later in Chapter 4.

While the public health situation in the 1960s has dramatically changed since then due to rapid urbanisation of the region as well as the development of the oil industry in the 1970s, the role of the government in many Arab states has transformed with it. Increase debt and external global factors have driven many Arab countries to develop more liberal economic approaches [4]. Jabbour et al suggested that economic and health inequalities between the rich and the poor have increased as the Arab countries moved in the early 1980s from socialist ideologies established in the 1950s and 1960s, particularly in the field of healthcare and public health, into a more neo-liberal environment with a growing emphasis on privatisation of health services [4]. The literature suggests that public sector healthcare in several Arab countries has been perceived by the people since the 1980s to be for individuals of lower socio-economic status who cannot afford private healthcare, despite the fact that there are limited studies that compare the quality of care between the two sectors [4].

Rapid urbanisation coupled with high birth rates and improved life expectancy has also presented Arab governments with the task of planning the expansion of cities in a largely arid landscape with limited rainfall and natural water supplies. In Kuwait and other GCC countries the challenge was complicated by the added public health risks of living in close physical proximity to oil refineries in limited arid land. As a result, many of the settlements and cities in the Arab region as a whole were built in proximity to natural water supplies or ease of access to the sea (as in the case of Kuwait's capital, Kuwait City). El-Batran has suggested that poor urban planning that started in the 1970s and 1980s has presented the region with slums in many urban areas where they previously did not exist [158]. In Kuwait, slum-like housing conditions exist only in the Taimah district in the city of Jahra, referred to as "ashish" in the local dialect. This will be covered in more detail in Chapter 4.

3.5 Regional efforts to tackle inequalities in the Arab States:

The League of Arab States has had many collaborations with international health agencies in the past. One such example was the Millennium Development Goals (MDG) as a joint agreement between the UN and the League [4]. At the time of writing, there have been three main reports concerning the MDG, with the second of these launched in 2007 primarily focusing on the growing problems of the youth population of the Arab States. The report's purpose was to assist their governments by providing a "youth lens" for their public health challenges [4]. The success of these efforts remains a debatable topic. The political atmosphere that gave rise to Arab nationalism and unity along with socialist governmental healthcare has changed and the literature does suggest that many Arab regimes now view regional unity in a more negative manner. According to Mahjoub et al, many Arab governments do not appear to be dedicated to supporting regional public health efforts in light of current political disagreements between countries within the League [159].

Regional efforts to tackle economic exclusion and social inequalities were proposed in the first Arab Economic, Social and Development Summit in Kuwait in 2009 [4]. A second summit was held in Egypt in 2011, several weeks before the ousting of then-president Hosni Mubarak, in what is commonly referred to as the Arab Spring. These efforts coincided with the 2008 Doha Declaration on Primary Health Care, which was signed by almost all Arab states (including Kuwait). This declaration proposed a return to healthcare systems of the 1970s that focused on primary healthcare and preventative public health measures. Measuring the outcomes of these Summits and the Doha declaration would prove difficult at this stage and beyond the scope of this research.

Although the EMRO branch of the UN does not include all the Arab states in this regional office as mentioned earlier in this chapter, they have launched regional initiatives to tackle health inequalities and inequities based on the recommendations of the Commission on the Social Determinants of Health (CSDH) using existing data from five Arab countries, including Oman from the GCC countries [4]. The main goal of this initiative in its first meeting in 2009 was to organise stakeholders in each regional country through intersectoral action to tackle the social determinants of health through a health equity lens. Additionally, the involvement of the local communities was encouraged, and each country was given the freedom to tailor

the initiatives based on the individual needs of their population. While all Arab countries in the EMRO office took part in several joint meetings held in this initiative, interest and progress was only observed in Egypt, Morocco, Jordan, and Oman [4].

In a review of health equity in healthcare policies within the Arab states, Jabbour et al., have found that although eight different countries explicitly mention the concept of "equity" in their annual goals and policies, none with the exception of Qatar appear to have a comprehensive understanding of health equity and how to address it [4]. Qatar's approach is relatively recent and "equity for all" was proposed in their healthcare policy in 2009. Other countries, such as Morocco and Jordan, were found to acknowledge that inequity was a major challenge for their respective populations, particularly in relation to the differences in access to healthcare services between rural and urban areas, although intra-city differences do not appear to be addressed. With regards to the situation in the State of Kuwait, although health is viewed in the Kuwaiti constitution as a citizen's "right" and a state's "obligation", there is no mention of the concept of health equity within the Constitution or in recent healthcare legislative plans.

3.6 Patriarchy and Gender inequality in the Arab States:

Gender inequality regarding women continues to be a major problem in the Arab States [160]. Classic patriarchy and son preference are widespread in all countries of the region irrespective of country wealth [161]. Data from Jordan, Morocco, and Egypt has shown that boys are more likely to be breastfed for a longer median duration by approximately two months when compared to girls, although no data from the richer GCC countries exists for comparison [4]. While advances have been observed to reduce gender inequality in the past 30 years with the introduction of age of consent laws to tackle early marriage, cultural changes in traditional marriage and compulsory education for both sexes in most states, the situation is still complicated. According to Charrad, the legal actions taken by Arab governments to implement the education of girls were the most effective measure in reducing gender inequality in the region in the past 50 years [162]. In the same analysis, one of the main obstacles in reducing gender inequality was the perception held by some Arab women that their current gender status may provide them with financial security and

protection in a male-dominated society [162].

In the first five years of life, the biological female advantage with respect to mortality compared to males at the same age is observed and documented in almost all countries, and the Arab countries are no exception to this [4]. However, in adult women in the region, studies have shown that there is a gender disadvantage that is unlikely to be biological in nature. With respect to the occurrence of at least one chronic illness, the risk was found to be higher in adult females compared to males in all Arab countries (in Kuwait, Relative Risk = 1.35) [4]. A closer look at gender differences in Kuwait City and Jahra will be discussed in Chapter 4.

The literature has linked the impact of low SES, below secondary school level education and rural living to be more disadvantageous to women than men in the Arab States. In a cross-sectional study on poor self-reported health in Egypt, the difference between men and women who viewed their health as "poor" was smaller in the richest urban areas compared to most deprived areas in the same city, at approximately 5% and 29% respectively [163]. Other studies have found a link between increased professional and/or job autonomy and the reduction of mental and physical morbidity in women in Lebanon and Egypt [4, 155]. Gender appears to play a role with regards to poverty in Arab countries, as widows and women who have experienced a divorce or separation tend to be at a higher risk of morbidity and mortality than men in similar circumstances, with their position worsening as the number of children they have increases [4]. In the GCC countries, several studies have also found lower rates of physical activity in women compared to men, which the researchers have linked to cultural issues in the region [164, 165].

3.7 The Arab Spring: Youth populations and social inequalities

While the complete dynamics and events of the Arab Spring and its drivers are difficult to assess at this time, it is important to note that Kuwait was one of the first Arab countries to experience mass protests in the region in 2009. Regime change was not witnessed in the aftermath of the protests in Kuwait as in Libya, Egypt and Tunisia, or a civil war at a massive scale with international involvement, such as Syria, although it did result in the dissolution

of the Kuwaiti parliament and the resignation of the Prime Minister in 2011 (the political structure of the State of Kuwait will be covered in Chapter 4).

The literature has linked the phenomena of the Arab Spring to the growing youth populations as proportions of the total population observed in the countries of the League of Arab States [4]. Even though the concept of a democratically elected parliament and government was not present in pre-Arab Spring countries, except for Lebanon and to a lesser extent in Kuwait and Jordan, the demand for economic and social inclusion and not political exclusion have been suggested as the main drivers behind the mass protests [4]. Guetat has stated that the Arab States was the worst region in terms of governmental corruption at a global scale and it has cost the countries approximately 30% of their income in the past 50 years [166, 167]. According to Salem, most Arab governments have had an active role in hindering the development of the educational, scientific and health sector of the region [168]. Hence, although the so-called Arab Spring is on-going, the causes appear to be social in nature and linked to inequalities and social determinants of health. Additionally, high unemployment rates have been recorded in many of the Arab countries, particularly in the younger age groups (estimated at approximately 25%) and recent college and university graduates [4]. This rate was higher for young women and their opportunities were more limited than their male counterparts.

Despite the fact that overall poverty (based on the World Bank cut off of 1.90 US Dollars per person per day) has been reduced in the Arab States when excluding the LDAC countries, from approximately 30% in the early 1980s to less than 20% in the mid-2000s, the picture was not uniform in the limited inter-city and intra-city data in each country [4, 169]. According to Benar, income inequalities have increased within 7 Arab countries, including Kuwait, between 1995 and 2005 [170]. Similar conclusions were drawn in another study when reviewing consumption data based on SES in these countries [171]. Bibi et al., argue that to better understand the situation in the comparatively oil-rich Arab GCC countries, such as Kuwait, inter-city and intra-city approaches in these countries are required as the picture is more complex when compared to other Arab countries [172]. Kuwait and other GCC countries have provided their citizens with food rationing schemes and annual “bonuses” based on country oil revenues since the 1980s, although there are no studies that have evaluated the effectiveness of these measures in reducing inequalities.

3.8 Urban Health of young people in the Arab States

Overview:

While the previous section has examined in brief the social, political, and cultural dynamics that are distinct to the Arab States and their impact on the State of Kuwait, this section will provide a general overview of existing urban health issues in young people that have been addressed in previous literature in the Arab States. As our study population in this research focusses on young people aged 14-16 years from the two main urban areas (Kuwait City and Jahra) in the highly-urbanised State of Kuwait, it is important to review existing Arab States urban health literature in this age group separately, due to the close link Kuwait shares within the fabric of the Arab States.

As mentioned in the previous section, there is a lack of health research in the field of public health in Kuwait and the Arab States with regards to young people. Most of the existing urban health data found in the literature review has been on the very young or elderly. Soweid and Nehlawi noted in their twelve-year review of young people's health in the Arab countries that they recorded only 83 epidemiological studies, averaging less than four studies per country in their study period [4, 173]. In a more recent review, Afifi et al have commented that even though joint efforts by the WHO and the Arab nations have improved the availability of data on certain urban health issues, such as smoking prevalence in young people, there is still a lack of health data on young people in the region [4]. Hence, any existing literature in the region could provide insight into understanding the underlying urban health issues for this population. With young people comprising approximately one quarter of the population of Kuwait, it is essential to understand how urban living impacts on their health and well-being [3].

The existing literature on the health of young people in the Arab States will be reviewed in this section in relation to three different public health priorities associated with urban living and urbanisation, namely: Overweight and obesity, tobacco smoking and cannabis use, and general mental health. These three issues are the primary focus of the current Kuwait Healthcare Legislative Plan policy applied by the Government of Kuwait in their emphasis on young people in urban settings [174].

It should be noted that the rationale of the Kuwaiti government for addressing these three key issues was not based on existing local data on young people from the two selected cities of Kuwait City and Jahra, but on the basis that they have been reported to be major public health concerns in other Arab countries and global urban health studies on young people. While these topics are highlighted by the Government of Kuwait in their health policy, there are no recent data on these issues in the country. The details of the current Kuwait Healthcare Legislative Plan and its focus on young people in urban settings in Kuwait will be covered in detail in Chapter 4 of this research. One aspect of the current research will be to look at these public health priorities and contrast with other important indicators of urban public health.

A) Overweight/Obesity:

The Arab States has some of the highest overweight and obesity prevalence rates in the world, particularly in the oil-rich GCC countries such as Kuwait [4]. With regards to childhood overweight prevalence under the age of 10 years, Kuwait as a country has the second highest rate in the Arab States at 31.8% [175]. As the harmful health effects of being overweight and obese may present at a young age and carry a health risk for non-communicable diseases throughout a person's lifetime, there is a need to understand this trend and its drivers [4]. The limited studies found in the literature on young people aged 14-16 in Kuwait City and Jahra, will be covered in more detail in Chapter 4 of this research and suggest similar patterns of increasing rates of overweight and obesity.

King et al. have linked the increase in prevalence of overweight and obesity among adults in the Arab States to factors associated with urbanisation, although this literature review has not found studies explaining the phenomena in children and/or young people in the GCC countries [176]. In contrast to other regions of the world, socioeconomic factors were not suggested to present a clear consistent picture in overweight/obesity rates in young people in the Arab States and the GCC countries [4]. Some studies presented trends that differ from those detected in the West with regards to SES. For example, Mirmiran et al., have observed

higher overweight rates in young people from higher SES families in urbanised areas compared to lower income households of the Arab States in the same countries [175]. Furthermore, higher rates of overweight young people were recorded in urban settings compared to rural Arab settings [175]. Physical inactivity has been proposed as a contributing factor in overweight/obesity in several studies in young Arabs in urban settings [4].

There is a growing emphasis in the literature that important dietary changes have taken place in the past two decades in the Arab States, particularly in Kuwait and the wealthy GCC countries [4]. Traditionally, these countries have had a diet rich in fish, vegetables, olive oil, and high in fibre, with similarities to what is commonly referred to as a Mediterranean diet [4]. Since the late 1990s, dietary habits in Kuwait and other GCC countries have witnessed a trend of a more Westernised diet and an increased consumption of processed meals and fast food [175, 177].

Shawky et al., proposed a possible link in the increase of dental caries in young people in the region with the change of dietary habits [4]. While the literature suggests that the number of fast food outlets and their use is increasing in among children in the Arab countries, evidence is lacking in terms of studies linking them to the increase in prevalence rates of overweight/obesity in young people in the region [4].

There is evidence that overweight/obesity is more prevalent in adolescent girls throughout the Arab States, with gender differences more prominent in the GCC countries [4]. Within the GCC countries, studies from Saudi Arabia and Qatar have found overweight and obesity to be higher in young girls compared to boys of the same age group [4]. Al-Saaed et al., observed an obesity rate of 20% in adolescent girls compared to 15% in boys in the city of Khobar, Saudi Arabia [178]. Moreover, overweight rates were found to be high throughout the region, with the highest being 37% and 45%, in Lebanon and Saudi Arabia respectively [4].

According to Galal et al., Kuwait and other rich GCC countries are not observing two groups of young people of overweight and underweight in the same city based on SES as in the rest of the Arab States but a widespread prevalence of overweight and obesity in all SES [177]. Due to the limited availability of studies in this age group, particularly studies which compare two cities within the same country in the Arab States, presenting a clear picture for the drivers of the increasing prevalence of overweight/obesity for the region is still a challenge.

B) Tobacco Smoking and illicit drug use:

i) Tobacco Smoking:

Unlike research on overweight/obesity in young people, there are more data on tobacco use in this age group in the Arab States. This is partially due to the existence of the WHO database on Global Youth Tobacco Survey (GYTS), which is part of the Tobacco Free Initiative (TFI), that has helped provide information regarding this public health issue [179]. Within the EMRO, Kuwait and 21 other Arab countries have taken part in the GYTS in a standardised questionnaire on smoking tobacco products in young people aged 13-15 years. The evidence from the GYTS and other sources suggests that tobacco is a crucial public health issue in Arab countries in young people and Kuwait is no exception to this [4]. However, it should be noted that while the data available on the EMRO website from the GYTS has presented a worrying trend of increasing prevalence of smoking tobacco among young people in Kuwait from 2001 to 2009, it does not provide an insight between intercity and/or intracity differences in tobacco use. Furthermore, it does not provide information on SES and tobacco use in these young people. The latest GYTS available on the EMRO database is from the 2009 survey where data from all of Kuwait's cities were pooled from randomly selected schools in all the five major cities [179]. The results of the GYTS data in Kuwait will be discussed in more detail in Chapter 4.

While in the past the literature has suggested that the percentage of adolescents aged 13-15 years in the Arab States who have ever smoked tobacco products to be higher in areas of conflict (such as Iraq), more recent data from the GYTS presents a different picture of increasing prevalence in all countries of the region [4]. From the most recent GYTS data, the percentage of adolescents aged 13-15 years who have ever smoked tobacco products in the region, ranges from 36.2% to 10.2%, in Lebanon and Oman respectively [179]. Except for Oman, all the rest of the GCC countries (including Kuwait) have reported that more than 25% of youths who have ever smoking tobacco products [179]. There was a gender difference in all countries with regards to ever smoking tobacco products in the GYTS, with boys more likely to have tried smoking tobacco compared to girls and this difference appears to be larger in GCC countries [179]. For example, 35.8% and 34.6% of boys have tried smoking tobacco products compared to 23.5% and 15.6% in girls, in UAE and Saudi Arabia

respectively [179]. Similar sex differences were also observed for current smokers. In UAE, 14.6% of boys were reported being regular smokers of tobacco compared to 6.4% of girls[179]. It is important to note that per GYTS data, Kuwait had the highest prevalence of current smokers of tobacco aged 13-15 in the GCC countries and one of the highest in the Arab States at 25% and 11.3%, for boys and girls respectively [179].

One of the challenges of studying tobacco trends in the Arab States is the widespread use of alternative cultural modalities for its delivery, such as the waterpipe or shisha. Shisha smoking, sometimes referred to as goza or narghiles, is a culturally acceptable method of social interaction in public places and family gatherings in Kuwait and most Arab countries [4]. A shisha typically consists of a head, where the tobacco is placed, and a bowl of water connected to a hose with a mouthpiece for the smoker [180]. The tobacco is usually heated by charcoal and is cooled through water and the smoker inhales it from the mouthpiece [180].

While cigarette smoking is viewed as more of a masculine practice in the region and is perceived negatively when a woman smokes cigarettes in public, smoking shisha does not appear to carry the same stigma for women [4]. However, there is evidence that shisha smoking is perceived as a working-class activity, one that is not practiced by higher SES individuals [4]. Shisha smoking in a family setting is not viewed in the same manner as cigarette smoking and young people trying shisha with their parents is not considered as culturally taboo as cigarette smoking [180].

The literature suggests that smoking shisha is widely perceived in the region to be less harmful than smoking cigarettes and/or is not considered smoking tobacco [180]. Hence, tobacco studies in the region have in some cases highlighted the different smoking modalities when evaluating smoking prevalence. According to the WHO, shisha smoking causes many of the health risks caused by cigarette smoking, such as coronary heart disease, stroke, chronic obstructive pulmonary disease and lung cancer [180]. Furthermore, as shisha smoking sessions last longer on average than cigarette smoking, the smoker is inhaling more smoke per session, which could equate to approximately 100 cigarettes per 60-minute session [180]. Nicotine addiction occurs with shisha smoking although the mode of its deliver is still not fully understood [180]. As shisha smoking occurs in a social setting, the risk of second hand smoking is present and this risk is higher for young people [180]. In the

latest GYTS data in 2009 for Kuwait, 11.8% of those aged 13-15 years were current shisha smokers [179]. As previously mentioned, the GYTS data from Kuwait will be covered in more detail in Chapter 4.

ii) Alcohol and illicit drug use:

Even though the region plays a central role in the cultivation and transport of illicit drugs to other parts of the world, little is known about the effect of the problem on young people in Arab countries [4].

Smaller studies and reports have proposed that the issue of substance abuse and misuse is growing in young Arabs in urban settings, with alcohol and hashish being the most commonly abused substances [4]. According to Okasha, hashish was the most likely drug used by young people in a smaller scale study conducted in schools [182].

Afifi et al., have commented that there still exists a political and religious resistance in the region that has prevented studies to evaluate illicit drug use in young people and whether it is a public health issue in the region [4]. However, in the same review they also stated that most Ministries of Health in Arab countries, including Kuwait, have acknowledged that more needs to be done to understand prevalence of illicit drug use in young people in their respective populations [4]. Alcohol also carries a cultural and social taboo as most Arab countries have large Muslim populations for whom alcohol is not permissible. In Kuwait, alcohol is not available for sale to Kuwaiti citizens [182]. Although the prevalence of adult alcohol consumption is low in Arab countries compared to global consumption, little is known about consumption in young people in the region [183]. The literature has not yielded any epidemiological studies on young people in the GCC countries with regards to alcohol consumption.

C) Mental Health:

Although there is a dearth of evidence in the field of mental health and young people in urban Arabic settings, it has been identified as an area of concern in young children and adults in the region [4]. Mohti was one of the first to indicate that mental health in young

people should be a priority for all the countries in the region irrespective of wealth due to the rapid urbanisation the region has witnessed [184].

Research in younger children in the region has proposed that attention deficit hyperactivity disorder (ADHD) were associated with poor school performance and anti-social behaviour. However, these disorders are not formally identified in a standardised medical definition for the region as in Europe and the West [4]. Bener et al., noted in a study on primary school children in several Arab countries that ADHD was associated with lower socio-economic and mother's educational status, although the study did not examine inter-city and intra-city differences [4, 185].

One country within the GCC countries that has had more research in the field of mental health in young children compared to the rest is Oman. In a study on children in the city of Muscat in Oman, the prevalence of depression and anxiety was 5.0% and 15.0%, respectively [4, 186]. A cross sectional analysis conducted in Oman for World Mental Health in young people aged 13-15 years found that being female, not eating a balanced diet, and poor social support at school and home were factors associated with depression [4, 187].

The development of the Global School-Based Student Health Survey (GSHS) in 15 countries in the region, including Kuwait, has helped to provide some understanding of the needs of young people in certain aspects related to mental health. The GSHS was developed in a partnership between the WHO and the Centres for Disease Control (CDC) as a school-based survey in young people aged 13-15 years [188]. The latest GSHS recommendation report for Kuwait was conducted in 2010 and will be discussed in more detail in Chapter 4 covering the health of young people in Kuwait City and Jahra. However, it should be noted that the GSHS does not provide intercity or intracity comparisons and only provides data about limited health parameters at a country level. Furthermore, countries in the region have tailored parts of the GSHS questionnaire, whether by changing or omitting questions, to suit their specific populations. Therefore, a standardised questionnaire does not exist in Arabic for the region [188]. Also, the GSHS questionnaire only provides limited data on mental health issues in young people, such as suicide, loneliness and having close friends, and lacks the details provided by other modalities, for example the Strength and Difficulties Questionnaire used in the EURO-URHIS-2 questionnaire for young people [188].

Despite the limitations mentioned above, the data obtained from the GSHS has provided evidence that loneliness and suicidal thoughts in young people seem to be issues that need addressing in the region. For example, in Jordan and Tunisia, the percentage of young people who felt lonely most of the time during the year was 14.7% and 17.2% respectively[189, 190]. In girls, this was higher for the same question at 19.1% (Jordan) and 20.4% (Tunisia). When students were asked about seriously contemplating suicide during the last year, 20.2% and 15.0% answered yes, in Oman and Lebanon respectively [191, 192]. This percentage was also higher in girls in both countries. These relatively alarming rates of suicidal thoughts observed in the GSHS in these Arab populations along with the latest data from the GSHS conducted in Kuwait are discussed further in Chapter 4 (Section 4.8.3) of this thesis.

The literature has suggested that higher depressive symptoms in girls in the region could be linked to the cultural factors associated with classic patriarchy and a male-focused society [4]. While enforcement of age of consent and minimum age of marriage laws in the Arab States have helped in the field of mental and sexual health, the full picture is still not known. Since 1984, the minimum age of marriage in Kuwait is 15 for girls and 17 for boys [193]. Sexual relationships outside marriage are illegal under the age of 21 for both sexes. Hence, despite these laws providing protection to young people, they have created a political and social atmosphere that have placed barriers on researching mental and sexual health [4]. The limited research in mental health among young people in Kuwait will be covered in more detail in Chapter 4 of this research.

Background: Section B: Chapter 4

4: Kuwait and the health of young people in its two main cities, Kuwait City and Jahra.

4.1 Overview:

While the previous section has discussed urbanisation and the health and well-being of young people within the wider context of the Arab States and the impact on urbanisation on young people, this section will focus on Kuwait and the health of its young people in its two main cities Kuwait City and Jahra.

The country is highly urbanised and has witnessed a rapid urbanisation process since the late 1960s, with an estimated urban population of 98.3% [4]. As previously mentioned, young people under 15 make up 25.9% of the Kuwaiti population and their health in urban settings has been one of the primary focuses of the government [194].

Chapter 4 is divided into four main parts. The first part will present an overview of the State of Kuwait in terms of its geographical location, history, economy and relevant demographics. The second part will cover the key socio-cultural and demographic differences between the populations of Kuwait City and Jahra, along with the evidence presenting Jahra as a less affluent area. The third part will provide a brief description of the healthcare system and the current legislative health policy available for young people in the cities of Kuwait City and Jahra. Finally, the fourth part will discuss the limited health research available on young people in the State of Kuwait.

Emphasis will be placed on the three core topics that were highlighted by the Government of Kuwait in their current and ongoing Healthcare Legislative Plan: overweight/obesity, tobacco and cannabis use and general mental health in young people. As previously mentioned, the current Healthcare Legislative Plan implemented by the State of Kuwait had placed a central focus on its young people and their needs in a highly-urbanised country,

despite the limited evidence available in this population. The focus by policy makers in Kuwait on young people and the three specific urban health issues mentioned above was based on existing data in the Arab States and WHO in young people in urban settings citing lack of local health data at country and city level [174]. Hence, despite efforts from the Government of Kuwait to focus on young people, the situation and their needs are still unknown due to the limited data available in this age group. The issue of limited epidemiological data in Kuwait on young people will be discussed in more detail in this chapter.

4.2 The State of Kuwait: An Overview

a) Geographic Overview:

The State of Kuwait is located in the Middle East, with its largest urban area and capital, Kuwait City, situated on the Persian Gulf (see location on Figure 4.1). To the east of Kuwait City is the country's second largest city, Jahra. Both cities will be the focus of this study in their respective young population aged 14-16 years. Kuwait is part of what is referred to as the GCC (Gulf Council Countries), which also includes the United Arab Emirates, Qatar, Oman, Saudi Arabia and Bahrain as member States. These group of countries form a subset of resource-rich countries within the Arab States (as described in Chapter 3).

b) Historical Overview:

Archaeological evidence has revealed that human settlement and activity existed within the boundaries of modern day Kuwait before the 4th century BC [195]. While accurate historical information of this area dating back to that period is limited, there is evidence that the current borders of Kuwait were part of what was referred to as the "fertile crescent" of ancient Mesopotamia [195]. In addition, the area might have been part of the Greek Empire in the Bronze Age and its coastal regions could have been military posts [196]. Between the 5th century and 16th century, the land has provided a crossing ground for various nomadic tribes in search of more fertile land to the North the Tigris and Europhates Rivers [196].

Figure 4.1: Map of the State of Kuwait [Source: United Nations. 2010. Country Database available from URL http://www.un.org/Depts/Cartographic/map/profile/kuwait.pdf]

It was not until the early 1700s that the establishment of the coastal fort by the Beni Khaled Arabs marked the first developed and centre of what is now referred to as Kuwait City, the capital of modern day Kuwait [197]. Over time, this establishment brought an influx of new settlers from different regions of the Middle East, predominantly from Arab countries, and also provided an important trading dock for the Persian Gulf [198].

During the time of the Ottoman Empire, Kuwait and its rulers, the Al-Sabah family, had relative autonomy in governing their land and port [195]. The literature suggests that concerns of losing this autonomy and trade ties, coupled with border disputes with Saudi Arabia, drove the Kuwaiti rulers to sign a protectorate agreement with the British Government in 1899 [196]. This treaty (entitled "The Exclusive Agreement") did not make Kuwait an official part of the Empire but gave the British free access to coastal ports of Kuwait in exchange for security from the Ottomans and other parties in the region [197].

The current borders of modern Kuwait were first marked in the Anglo-Ottoman Convention in 1913 between the British Empire and the Ottomans [196]. This ultimately gave the State of Kuwait its first territorial independence, although the protectorate agreement with Britain continued until 1961 [199]. During World War One, the treaty allowed the State of Kuwait to take a relatively neutral and insignificant role despite being in proximity to the Ottoman Empire[195, 196].

An important step that transformed Kuwait from a modest trading hub to the resource rich country was the discovery of crude oil in 1933 [199]. Although the Second World War delayed the drilling and export of oil from Arab region, by the 1960s this source of wealth provided the country with a rich and stable economy and started a period of urbanisation and modernity [195]. In 1962, the Kuwaiti government under Emir Abdullah Al-Salem signed a decree that transformed the country from an absolute monarchy ruled by the Al-Sabah family into a constitution monarchy with a new constitution and an elected state parliament[200].

As previously mentioned in Chapter 3, this constitution emphasised in Article 15 on health as a right of the citizen, which paved the way for the formation of a government funded National Health Service and the restructuring of the Kuwait Ministry of Health as the primary provider of healthcare for the country [200].

Despite the decrease in oil prices witnessed in the 1980s, the literature suggests that Kuwait was not affected as much as other countries in the Arab States due to its relatively high income and smaller population in comparison to other oil-dependent Arab nations [201]. Hence, the liberalisation of economies due to decreasing oil prices and the movement towards the privatisation of the health and educational sectors witnessed in some parts of the Arab States in the 1980s and early 1990s, were not observed in Kuwait [201]. Economic growth and urbanisation continued in the subsequent decades following the development of the oil industry, however they were stalled by the invasion from the neighbouring Arab nation of Iraq in 1990. In addition to the economic costs of the invasion, estimated to be around 10 billion US dollars per year in the decade of 1990-2000 to repair the country's infrastructure, it also presented the country with political, social and environmental obstacles in the rebuilding process [195, 202]. The literature suggests that changes that occurred in the last two decades have resulted in cultural and social variations within the country, such as shifting in dietary habits and sedentary lifestyles associated with urban living. However, the drivers and the extent of the issue have not fully been studied due to the lack of recent data in urban health in Kuwait and its cities [4].

C) *Economical Overview:*

Despite its relatively small geographical area, approximately 9% of discovered worldwide oil reserves are located within the borders of Kuwait [202]. Crude oil is the most important export for the country with revenues exceeding 75% of total GDP [202]. The hot and dry climate of Kuwait and the scarcity of fresh water supplies have been an obstacle for the development of its agricultural sector, which has largely relied on greenhouses to supply the local population only [202]. Due to limited natural water sources, with only one fresh water source located near Jahra city, the population depends on sea water desalination plants to provide approximately 70% of its water supply [4].

Finding alternative sources of income to reduce the dependency on oil has been high on the agenda of the government and Kuwait National Assembly (Kuwaiti Parliament) since its formation in 1963 [199]. However, the country’s economy has continued to rely on petroleum, natural gas and petrochemicals as its main source of income despite the government’s

efforts [203]. Nevertheless, Kuwait has had a stable economy with one of the highest GDP (based on purchasing power parity) per capita in the world and the second highest in the Arab States after Qatar [204].

Kuwaiti laws prevent children under the age of 15 years from participating in the labour force [205]. Unemployment rates for the Kuwaiti population above age 15 were estimated at 2.2% and have increased to 4.7%, in 2010 and 2015 respectively [203]. For both genders combined, unemployment rates were 22.1% in the Kuwaiti population aged 15-24. However, unemployment rates decreased to 4.6% in the 25-34 age group [205]. Kuwaiti females aged 15-24 were more likely to be unemployed than males in the same age group, at 31.5% and 17.1% respectively. Those aged 15-24 make up 8.4% of the total Kuwaiti labour force of the country, with over 80% of them working in the public sector. According to the government sponsored labour force survey, the most common reason for economically inactive males in Kuwait being outside the labour force was studying while in females it was family and child commitments [205].

The Government of Kuwait supports its citizens with subsidies and benefits in unemployment, however applicants must be above the age of 21 and most subsidiaries are only available to married couples or those with illness and/or disabilities [205]. There is a lack of evidence exploring the economic situation in young people and the support provided by their families. Additionally, the country does not provide official statistics comparing intercity differences in unemployment rates for its population.

4.3 Demographics of Kuwait:

Population Size, Growth and Age Composition:

In 2016, the mid-year population of Kuwait was estimated to be 3.77 million with most of the inhabitants living within the boundaries of Kuwait City [194]. This estimate presented an 18.8% increase from the population recorded at approximately 3.06 million in the last census data in 2011 [194]. When compared to the first census conducted in Kuwait in 1957,

the population of the country was 290,000 [206].

Compared to Western countries, Kuwait's population has a sizeable proportion of young people. In terms of age structure of the total population, the proportion of young people (under 15) is represented by 25.9% of the population [203, 207]. 19.0% of Kuwaitis are between 19-24 years old [208]. Despite the proportion of the population in the 15-64 age group increasing from 61.7% to 74.4%, from 1985 to 2015 respectively, the median age in Kuwait is 28 years [203]. A slight increase from 1.2% (in 1985) to 1.9% (2015) was noted for elderly (65 and above), although this age group is projected to increase to 19.1% of the total population in 2050 [207]. During 1990-1995, the population decreased during that period by 4.3%, this has been connected to the Iraqi invasion of Kuwait when many foreign nationals left the country[207].

The government of Kuwait has taken a pronatalist approach in its policy since the 1970s and offers married couples monthly benefits of 50 Kuwaiti Dinars (130 GBP) per child per month for up to four children [209]. However, estimated total fertility rate per Kuwaiti woman has decreased from 6.5 to 3.9, in 1987 and 2014 respectively [209, 210]. The estimated adolescent birth rate per 1000 Kuwait women (aged 15-19) at 9.8 is lower than the Arab States and very high income countries averages, at 47.7 and 17.0 respectively [211]. Gross Reproduction Rate (per Kuwaiti woman) was estimated at 1.9 in 2014 [210].

Overview of mortality data in Kuwait:

Non-communicable diseases account for 72.9% of the burden of disease in Kuwait [208]. The leading cause of death in Kuwait is coronary heart disease in both males and females [210]. Coronary heart disease and stroke account for 33% of all deaths in Kuwait [210]. Mortality from neoplasms is the second leading cause of death for both sexes, however diseases of the respiratory system and external causes of mortality including road traffic accidents, were the third commonest cause of death for females and males respectively [210]. As mentioned in Chapter 2, heart diseases, cancer and road injuries are caused by risk factors that can be linked to living in urban areas and urbanisation [212]. These risk factors can start to have an impact at an early age and cities play an important role in tackling them [213]. Hence

the lack of health-related research on young people in Kuwait, particularly in the known risk factors of urban living, presents a clear challenge for policy makers in predicting future trends in mortality and morbidity.

The Infant Mortality Rate (IMR) for Kuwait was estimated at 7.0 per 1000 live births in 2014 and is projected to decrease to 3.5 by 2030 [201, 203, 207]. In comparison, IMR was 7.5 per 1000 live births in 2011 [194]. Life expectancy at birth in 2016 was estimated for males and females at 77 and 80 years, respectively [194]. This is one of the highest life expectancy at birth in the Arab States and the EMRO region. The WHO healthy life expectancy, which includes years lost due to disability and illness, was estimated at 68 years [194].

Education and literacy rate:

School-based education is compulsory for all children between the ages of 6 and 15 years and Kuwaiti nationals enrol free in public schools and higher education at a college and university level [203]. Gross enrolment ratio (at secondary school between the ages of 12-17) is estimated to be higher for Kuwaiti females compared to males, at 98.9% and 88.2% respectively [215].

In the 2005 Census, adult literacy rate (aged 15 and above) was 93.3% and the Census committee advised the Kuwaiti government to increase funding on education and focus on increasing literacy rates [216]. In the most recent census data, the adult literacy rate and youth literacy rate (Kuwaitis aged 15-24) were 96.1% and 99.5% respectively [194]. No gender differences were observed in Kuwait in terms of youth literacy rate in the latest government data and no official figures are provided comparing between cities [194]. The UNESCO estimates that 3.8% of Kuwait's GDP was spent on education and 1.4% was spent on secondary education in 2014 [215].

Classifying the State of Kuwait: developed or developing?

Kuwait's GDP per capita is among the top 10 countries worldwide according to the UN, estimated at 76,075 USD [217]. The high per capita GDP is attributed to the small population of

Kuwaiti nationals and the high price and demand of crude oil [4]. Based on its economic status, the World Bank classifies Kuwait as a high-income country in its three-tier division of low, middle and high-income countries [218].

The literature review does not suggest a clear-cut definition for categorising a country as "developing" or "developed". However, the United Nations Statistical Division states the following:

"*There is no established convention for the designation of developed and developing countries or areas in the United Nations system. In common practice, Japan in Asia, Canada and the United States in northern America, Australia and New Zealand in Oceania, and Europe are considered developed regions or areas."* [219]

This would place countries that are geographically situated in Asia such as Kuwait, Hong Kong, Qatar, UAE and Singapore as "developing", even though they have a high income and stable economy [217].

Another common method of classifying countries is by using the "Human Development Index (HDI)". This was first used in the 1990 by the United Nations and evaluates a country's "development" based on three key indicators: economic, health and education [220]. In 2009, Kuwait was ranked overall 27th worldwide, with a "very high HDI" [221]. For the 20th Anniversary of the Human Development Report, the UN revised the method to calculate the HDI [220]. In previous years, the education index of the HDI was calculated using adult literacy rate (expressed in %) and combined gross enrolment ratio in education (for both sexes) [220]. However, in the revised HDI of 2010, education was measured using "mean years of schooling (of adults)" and "expected years of schooling (of children)" instead of the previous methods [220]. In contrast to the previous method, data on these revised indicators are not routinely available in Kuwait, therefore census data from 2005 was used to estimate the 2010 HDI onwards [216]. Based on the 2016 revised HDI, Kuwait was still ranked as a "very high HDI" country, but its rank fell to 51st [220].

As mentioned in Chapter 3, gender inequality and classic patriarchy remain critical issues due to cultural and social factors throughout the Arab States and Kuwait is no exception. The Gender Inequality Index (GII) is a tool used by the UNDP and takes into account the

disadvantages facing women in reproductive health, labour market participation and empowerment [211]. In contrast to the HDI, lower GII indicates a better achievement in gender equality [211]. Based on 2015 data, Kuwait was ranked 70th out of 153 countries in the GII [222]. While Kuwait performed more favourably in terms of maternal mortality ratio and adolescent birth rates (aged 15-19 years) compared to other Arab States and very high HDI countries, this was not the case in areas of female empowerment [211]. The Human Development Report 2016 for Kuwait highlighted important limitations in indicators of female empowerment within the GII, such as "Parliament Representation". Although women have the right to vote and elect in the Kuwaiti Parliament (Kuwait National Assembly) they have been underrepresented with the largest number of seats ever won by women was 4 out of 50 seats, all of which were representatives from Kuwait City [223]. At the time of writing, women are only represented by 2% of the current Kuwaiti Parliament [211]. In comparison, the number of women seats in parliaments of the Arab States and very high HDI countries were 15.5% and 25.8% respectively [211].

In the recently established Gender Development Index (GDI), which addresses gender inequalities in 3 areas (health, education and control over income), countries are categorised within a five-group system (group 1 having the highest equality between men and women) [211]. Kuwait was placed in Group 2, as a country that has medium-high equality[211]. Although Kuwait with a GDI value of 0.972 achieved better than the Arab States average (0.856), it had slightly higher inequalities than the average in other very high HDI countries (0.980) [211].

4.4: Kuwait City and Jahra

4.4.1 Urban Areas and Cities in the State of Kuwait:

In order to assess the urban health of young people in Kuwait and Jahra it is important to review several intercity differences between the populations of these two cities. The literature suggests that the two cities have different demographic, social and cultural characteristics which will be reviewed briefly in this section.

Jahra has been presented as a less affluent and a more deprived city compared to Kuwait City, which in turn could impact the health of young people and increase the intercity and intracity health inequalities [194].

The vast majority (98.3%) of the population of the State of Kuwait live in urban areas and the country has one of the highest proportions of urban population in the world [224]. In comparison, in 1950 the country's urban population was 59.2% [225]. Between the years of 1950 and 1957, the urban population of Kuwait increased from 59.2% to 75.4% [194].

Kuwait is divided into five regional governates, which represent its six cities, namely: Kuwait City, Jahra, Mubarak Al-Kabeer, Farwaniya, Al-Ahmadi, and Hawali. Kuwait City, the capital and largest urban area has an estimated a total population of approximately 1.4 million when including all its districts and suburbs [194]. As the study population of this research is young people living in Kuwait City and Jahra, the focus of this chapter will be on key demographic, cultural and social differences between these two cities and not in other cities in the country. Previous studies have associated the people of Jahra with lower income, higher violent and drug crime rate, larger average family size and reported more urban health issues when compared to Kuwait City [194, 226, 227, 228].

4.4.2 Jahra: An Overview

Jahra (or Al-Jahra in the local dialect) is the largest of the five governorates of Kuwait in geographical size and the second largest city in population size after the capital Kuwait City[194]. The estimated population of Jahra governorate is approximately 560,000, with approximately 470,000 in its main urban region [194]. The proportion of young Kuwaitis (under 15 years) was estimated to be higher in Jahra compared to Kuwait City, at 35% and 23% respectively [229]. In terms of sex ratio, no differences were found between Jahra and other regions of the country [194].

The majority of the population of Jahra (approximately 80%) are of tribal background [230]. In comparison, the estimated Kuwaiti population of tribal origin in Kuwait City is less than 4% [194]. Kuwaitis from tribal origins generally have strong commitments and loyalty to their tribe with customs that differ from non-tribal Kuwaitis predominantly living in Kuwait City [209].

The literature suggests that the tribal origins of the people of Jahra could be linked to their larger family size and extended families living in a single household, stronger son preference and patriarchy [4, 209]. Furthermore, many of the tribal customs in the people of Jahra are observed in other Arabs from tribal origins in the GCC and the Arab States [4]. Within the Jahra society, having a larger family provides a positive status in their tribal community and strengthens the families influence in politics and employment opportunities [209]. In contrast, these cultural phenomena are not observed in Kuwait City. Social connectivity (or "wastaa" in the local dialect) is an important predictor of social status within the Kuwaiti and Arab society in general [231]. The concept of "wastaa" originated from traditional Arabic culture when merchants and group leaders used their social connections to achieve their desired goals and continues to carry importance in modern day Kuwait [232]. Quantitative studies on this social phenomenon are limited.

Prior to the discovery of oil in the 1930s, nomadic tribes travelled in the region of modern day Jahra and some have permanently settled in the city [199]. When they transitioned from a tent dwelling nomadic lifestyle into urban living, many aspects of their tribal life are still retained in modern day Jahra [209]. This is in contrast with the Kuwaiti residents of Kuwait City, where most trace their ancestry from cities and villages in the Arab States before settling in Kuwait [199].

Madi et al. stated that due to the predominantly tribal background of the population of Jahra, they have different social and cultural attitudes from the Kuwaiti population in Kuwait City [230]. Tribal Arabs place an expected active role on young people to act as caregivers for their families with sons providing financial aid for the family and daughters marrying at a younger age [4]. Evidence from other Arab cities with tribal populations suggests that social factors within these communities can delay or prevent completing a secondary degree education, particularly in the case of girls [4]. The data from Jahra and Kuwait City is presented at a country level and it is unknown what percentage of students complete their secondary school education from each city. While the cultural and social differences between Jahra and Kuwait City are known, the evidence is lacking on how these factors affect the health and well-being of young people living in these cities due to the lack of intercity data.

Jahra: A deprived and less affluent area compared to Kuwait City?

There is no official governmental definition for social class, deprivation or socioeconomic status (SES) in the State of Kuwait. Researchers have used different indicators in the past to measure social class, including monthly household income, education status, type of housing, and number of individuals per bedroom [194, 231, 233, 234, 235]. Shah et al commented that the traditional labeling of Jahra as a "less developed" urban area and Kuwait City as "more developed" is based on social and individual factors that are unique to Kuwait, since both cities have similar governmental funding and infrastructure in healthcare, sewage and availability of electricity and water [231]

Epidemiological studies comparing Jahra and Kuwait City have mainly focused on economic and morbidity factors in the very young or elderly, with little emphasis on young people [231]. As noted previously in this Chapter, IMR for the State of Kuwait was estimated at 7.0 per 1000 live births, while that of Jahra was estimated at 9.6 per 1000 for the same period[194]. Also, higher perinatal mortality (PNM) rates have been documented in Jahra compared to the rest of the country [226]. This has been linked with high parity, maternal age above 30 and higher chronic maternal disease observed in women in Jahra [226]. Furthermore, women in Jahra were found to start prenatal care later than those in Kuwait City [231].

The literature has stated that the incidence rate of major congenital malformations was found to be higher in Jahra compared to Kuwait City [230]. Existing literature has suggested that this may be due to the higher proportion of cultural inter-tribal marriage between Jahra inhabitants, particularly in congenital malformations caused by autosomal recessive inheritance [230, 236].

A higher prevalence of intestinal parasitic infection was also reported in children under the age of 12 in Jahra compared to all other governorates in primary health clinics [214]. Akpata et al. have reported higher prevalence of dental caries and poor oral hygiene in Jahra [237].

Previous studies have found a significantly higher total household income in Kuwait City compared to Jahra [194, 231, 233]. Furthermore, inhabitants of Jahra were more likely to live in government funded homes compared to those living in Kuwait City, at 35% and 10% respectively [194]. However, in privately owned villas and apartments, the number of

individuals per household was higher in Jahra than the Kuwait City [217].

With regards to female workforce participation and total years of education (for both sexes) both were found to be higher in Kuwait City than in Jahra [205]. Women from Kuwait City were three times more likely to complete a University level degree than those in Jahra, and ten times more likely to complete a postgraduate university degree [194]. In the most recent labour force participation survey it was estimated that most working males in Jahra were employed in governmental and military services while those in the capital region were more likely to be in professional and administrative occupations [205].

Urban areas in the Arab States with a larger proportion of tribal nomadic inhabitants like Jahra have reported a larger desired and actual fertility rates compared to non-tribal inhabitants [209]. In the most recent data conducted on Kuwaiti women based on tribal origins, tribal women from Jahra had a higher current and desired fertility rate than those from Kuwait City [209]. Women from Kuwait City with 3-5 children were less likely to desire more children compared to women in Jahra with the same number of children, at 27% and 44% respectively [209]. Moreover, women from Kuwait City were 1.6 more likely to use contraceptive methods than those in Jahra irrespectively of educational status [209]. Although larger family size was perceived to provide stronger social support, the literature suggests this can place a burden on young people in larger households, particularly in lower income families [4]. Due to the dearth of evidence, it is unknown whether these social factors are generating health inequalities in the young people of Jahra.

As mentioned previously, the minimum legal age of marriage in Kuwait is 15 for brides and 17 for grooms. The literature suggests that Kuwait City has witnessed the “marriage revolution” observed in other urban areas of the Arab States, with an older average age of first marriage for both sexes, a reduction in family arranged marriages, and a decrease in age difference between husband and wife [4]. There is evidence that this was not witnessed in Jahra [4]. For example, average age of marriage for males in Kuwait City was 27 years compared to 23 years in Jahra [238]. On the other hand, average age of first marriage for females was lower in Jahra compared to Kuwait City, at 21 and 24 respectively [238]. In all marriages in young Kuwaitis aged 15-19, 55% were documented in Jahra while only 11% were in Kuwait City, with the rest accounted for in other governorates [238].

Stateless people in Jahra:

The stateless (referred to in the local dialect as Bedoon) mostly live in the Taima district of Jahra city [194]. The grey literature refers to their housing as the only slums that exist in Kuwait [194]. Bedoon, are officially classified as illegal immigrants by the Government of Kuwait and do not have the rights that apply to Kuwaiti citizens and non-national expatriates [239]. Estimates of the total number of Bedoon ranges from 100,000 to 120,000 [194, 239]. Based on this, approximately one-fourth to one-fifth of the population of Jahra. Citizenship through naturalisation is rare in Kuwait, and citizenship is obtained from a father or mother of Kuwaiti nationality [239]. The government of Kuwait maintains that in order for a Bedoon to obtain citizenship, they must provide evidence of residency of a first degree relative in Kuwait prior to 1965 [240]. The stance from the government is that the Bedoon are allegedly hiding their true citizenship and have documentation from other countries [241]. Apart from the official number of Bedoon living in Jahra, there is very limited data on other demographic characters. Basic demographic data, including mortality and morbidity rates do not exist and the current political climate in Kuwait presents a difficult challenge for objectively assessing their situation. Hence, the literature review cannot provide an assessment of the current political situation of the Bedoon and the impact it has on their health and well-being and that of other inhabitants living with them in Jahra city.

Most Bedoon come from Arabs of tribal origins that are similar to the inhabitants of the Jahra city [4, 239]. It could be argued that the discrimination against the Bedoon is not a racial or ethnic one but a case of inequity due to a political situation of statelessness. Prior to the Iraqi invasion in 1990, Bidoon were treated like Kuwaiti citizens in terms of access to healthcare and education [240]. However post-1990, access to healthcare was limited to emergency care and Bedoon were required to pay for insurance schemes for operations and certain medical procedures. In 2010, the Government of Kuwait established the Central Agency for Illegal Residents in an effort to solve the Stateless situation [240]. While this improve the Bedoon's access to free health care and school education, it still presented them with barriers to work in governmental sectors and overseas travel [240]. Bedoon public university access is limited to selected seats and their application for governmental services such as a driver's license are studied per case [240]. More importantly, the Government of Kuwait still maintains that only 35% of the current Bedoon can apply for citizenship, with

the rest deemed illegible to do so cited an existing citizenship from another country [240].

The limited demographic data on the Bedoon estimates that 86% have not completed middle school as the government does not enforce compulsory education on them [240]. Approximately 56% of Bedoon are under the age of 15 (compared to 35% in Kuwaiti population of Jahra) and the average fertility rate was estimated at 5.1 in Bedoon women (compared to the national average of 3.9) [194]. Despite the Bedoon living in Jahra, the government does not consider them legal residents and their health statistics are not included in the Kuwaiti health data [240]. While the literature from other stateless populations in urban settings in the Arab States present clear health inequalities, the political nature of the topic has prevented the funding and availability of health research in Bedoon in Jahra [4].

4.5 Health care structure and health services for young people in Kuwait City and Jahra

The Kuwait Ministry of Health was established in 1936 and the first multidisciplinary public hospital (Al-Amiri) was opened in 1949 in Kuwait City [242]. Currently there are 6 multidisciplinary public hospitals in the country, with two within the Kuwait City governorate and one in Jahra [242]. In the 1950s, the government introduced free healthcare to all nationals and expatriates [242]. An annual medical insurance scheme for public hospitals was put into place for non-nationals by the government in 2000. However, young people under the age of 18 were excluded from this irrespective of their nationality and receive free health care access in the public sector [208].

The public sector of health care in Kuwait has covered an estimated 82% of all health care costs in the country. This has remained stable since the early 1990s [203]. It is estimated that the total health expenditure is 5.8% from the total expenditure of the government of Kuwait[243]. In an effort to decrease costs, the Ministry of Health has focused on improving and increasing the share of the private sector of health care, although this has not changed the situation and the dependency on the public sector [208].

The Kuwait healthcare system is divided into three levels: primary, secondary and

tertiary[242]. Point of entry for young people in non-emergency cases is through the primary care clinic, which are located in all residential areas in Kuwait City and Jahra [242]. These clinics provide daily care in the fields of family medicine, paediatrics, maternal care, dentistry, minor surgeries, immunisation and preventive medicine [208]. Young people are only allowed to register in the primary care clinic assigned to their area of residence. Patient records are inputted in a computerised filing system and are protected by patient confidentiality laws. Although in the case of patients below the age of 18, doctors have the right to inform the patient's parent or legal guardian if they deem a need to do so [244].

A study reported that Primary healthcare clinics were located further from residential areas in Jahra when compared to Kuwait City and less than 9% of clinics in Jahra were within a 1 kilometre radius of these areas [245]. Although the data reported on the average number of residences per PHC was similar for Kuwait City and Jahra at the government recommended 30,000 per PHC [242].

Access to secondary and tertiary public health services is through a referral from a general practitioner [208]. The secondary level includes multidisciplinary hospitals with outpatient facilities and patients are required to visit the hospital according to their area of residence. Each general hospital has a 24-hour emergency service [208]. Almost all public specialised tertiary centres are located in Kuwait City, and those living in Jahra are required to travel to access these services [242]. For example, young people from Jahra are referred to specialised mental health services in Kuwait City due to the lack of tertiary level services in Jahra [244].

Studies on access to health care for young people were not found in the literature search. However, a single study reported that young people in Kuwait City with parents in professional occupations were more likely to have "better connections" when seeking and utilizing non-emergency healthcare compared to rest of the population [232]. The same study also reported "wastaa" (explained in Chapter 4.5.2) to influence a young patient's decision to seek medical advice at that particular healthcare clinic, despite the law on access based on area of residence [232].

In secondary and tertiary level health care requiring non-emergency surgical procedures, psychological and psychiatric referrals, or drug dependence/abuse associated conditions, young people below the age of 18 are required to have their parent or legal guardian

available to sign consent forms [244]. Smoking cessation clinics cannot be accessed by young people without parental involvement [244].

Within the medico-legal structure of the Kuwait Ministry of Health, paediatric care ends at age 12 and young people between the ages of 13-18 are treated and classified as adult patients [244]. While transition health and social care exist in countries such as the UK, to help young people "transition" into adulthood, this care option is not available in Kuwait [244]. The literature has not revealed any proposals to introduce transition care or evaluate the current practices and barriers faced by young people at a health or social care level.

4.6 Health Policy in Kuwait and its Central Focus on Young People:

In February 2013, the Kuwaiti Parliament voted in favour of the country's Legislative Healthcare Plan for 2014-2018 [174]. This new proposal is a follow-up to the previous four-year Plan (2010-2014), which aimed to address the needs of the growing proportion of young people in Kuwaiti cities and the challenges faced in estimating the government healthcare budget [246]. While the Ministry of Health and the Kuwaiti Government have not released official assessment reports on the outcomes of the previous Legislative Plan, both the current and previous Legislative Plan have focused on young people and their health in a highly urbanised country.

It is important to note that despite this focus on young people in three key urban health issues (namely overweight/obesity, tobacco smoking and cannabis use, and psychological wellbeing), the Government of Kuwait has acknowledged in its policy the lack of research in young people in the country. Moreover, the recommendations were based on existing findings from EMRO countries and other high-income countries with large urban areas and a young population [246].

Kuwait Healthcare Legislative Plan 2014-2018:

As with all Parliamentary legislations that involve health policy in the State of Kuwait, the long-term health targets of the Healthcare Legislative Plan are implemented by the Ministry

of Health and assessed at the end of the proposed timeframe. The Legislative Plan is subjected to an annual review, where short-term targets are revised by a parliamentary and governmental panel [174]. Based on this panel and the short-term targets set, the Public Authority for Strategic Planning and Development (PASPD), a branch of the Government of Kuwait, has the role of allocating the budget and spending for each healthcare target [174].

One of the main reasons highlighted by the Kuwaiti Parliament in adopting a youth-focused policy is to curb future healthcare governmental expenditure due to the high dependency of the country on the unpredictable price of crude oil [195].

The current Legislative Healthcare Plan of Kuwait 2014-2018 has 4 long-term objectives. Three of these objectives are associated with the urban health of young people and their utilisation of healthcare services in Kuwait. These three objectives, along with a brief description from the Legislative Plan guidelines, are listed below:

1) *To Improve the access of young people to primary care services and increase the capacity of secondary and tertiary health care services, particularly in Jahra and other less affluent urban areas:*

   - Improving access for young people to primary care services and increasing the capacity of secondary and tertiary levels of healthcare was one of the principle areas of focus in the previous Legislative Plan 2010-2014 and is a key objective in the current strategy [174]. The current Plan has placed an emphasis on establishing new drug addiction, mental health, and rehabilitation centres for young people and at risk populations. Furthermore, it highlighted the barriers to young people in access to mental and social care in urban areas outside of Kuwait City, such as Jahra and others. It also detailed plans to complete a new multidisciplinary hospital to treat residents in the Mubarak Alkabeer Governorate to reduce the patient load on Jahra and Kuwait City [174].

2) *To increase the total number of youth-focused nursing and social care staff in all three levels of healthcare to accommodate for the growing young urban population:*

- By 2018, the Legislative Plan hopes to increase the number of qualified nurses to cope with the increasingly young population of Kuwait [174]. The Plan indicated that while the number of doctors is adequate for the current population and future projections, the same cannot be said about qualified nursing staff, particularly those trained to deal with young people and their health needs [174]. Moreover, the objective to increase youth-focused nursing staff has been cited by the Kuwaiti Parliament Health committee as a solution to reducing the patient load and waiting times in primary care clinics [174]. According to the Ministry of Health, there were 0.87 nurses per 1000 population in 2011 and the current Healthcare Plan aims to increase this number to at least 2.50 nurses per 1000 population by 2018 [247]. Also, the Plan aims to increase the number of Arabic speaking nurses, citing that 70% of the nursing staff were non-Kuwaiti and language and cultural barriers exist between young people and the nursing staff [174].

3) *To evaluate and improve public health policies for the youth population and their interaction with urban living:*

- While the proposals have had a stronger emphasis on curative medicine, the current Plan 2014-2018 explicitly choose to focus on young people, particularly in the following three urban health issues: overweight/obesity, smoking and substance abuse, and psychological distress [174, 246]. The Plan has acknowledged the lack of epidemiological evidence in Kuwait in young people and has encouraged the Ministry of Health and other governmental agencies to promote and increase the budget of public health research in these fields [174]. In addition, the government has focused on these issues in urban health in young people based on regional EMRO evidence and proposals from the Arab League and WHO, due to the lack of local data on these issues [174, 246]. The policy also stressed on understanding the impact of lack of physical activity in young people and the prevalence of overweight and obesity in the Kuwait population [174]. Furthermore, it has recommended establishing youth-focused mental health clinics at a primary level. Finally, the Plan proposed school-

based health education programmes [246].

4.7 Existing Literature on the Health of young people in Kuwait City and Jahra

Section Overview:

This section divided into three sub-sections focusing on existing data in young people in Kuwait City and Jahra. These will discuss the literature according to the three urban health issues highlighted by the Government of Kuwait and Ministry of Health in their current Healthcare Legislative Plan (overweight/obesity, tobacco and illicit drug use, and mental health and psychological wellbeing). Also, any intercity and intracity differences observed between the young people of Kuwait City and Jahra will be mentioned.

As previously mentioned, there is a dearth of evidence in epidemiological research in young people in Kuwait and the situation remains largely unknown with regards to the urban health issues and health inequalities at country and intracity level. Additionally, the literature review has revealed that most of the existing research is either from international initiatives, such as the Global Youth Tobacco Survey (GYTS), or smaller epidemiological studies conducted before the early 2000s from Kuwait University [4]. While previous sections in this Chapter have discussed the demographic, epidemiological and cultural differences between the populations of Kuwait City and Jahra, little is known if these issues are resulting in health inequalities between the young people in these two cities. Also, intracity data comparing the health of young people in Kuwait City and Jahra are extremely limited and the evidence is lacking in key urban health indicators.

4.7.1 Overweight and obesity:

The literature suggests that there is lack of recent data quantifying BMI and evaluating this

urban health issue in young people in Kuwait. No studies were found comparing intracity data on overweight/obesity in young people between Kuwait City and Jahra. Therefore, the limited studies on data examining overweight/obesity in young people in Kuwait will be discussed below.

While obesity and overweight are a global concern, for the past two decades the problem has escalated considerably in Kuwait [248]. A rapidly improving economy and urbanisation during the 1980s and 1990s brought about dietary changes to the indigenous diet of Kuwaitis that was high in fibre and protein and low in carbohydrates into a more Westernised diet [249, 250]. In a study on adult Kuwaiti men and women, overweight rates in men and women were at 78.0% and 80.4% respectively [251]. This data places Kuwait at the highest prevalence of overweight adults regionally and one of the highest globally [252]. Higher BMI in adult Kuwaitis living in Kuwait City was associated with low income, consuming fast food meals, low levels of education, and low physical activity [249]. The same study also found that BMI increased with number of family members living in the same household [249]. No studies were found examining the sociocultural variables and overweight/obesity and BMI in Jahra.

The rationale behind including overweight and obesity in young people as a key focus of the Government of Kuwait was not only due Arab League and EMRO recommendations, but also because of the high prevalence rates of overweight/obesity found in the adult and child population in the country [174]. The Ministry of Health (Kuwait) has cited lack of physical activity and the changing dietary habits in the country, from a healthier “Mediterranean” diet into a more Westernised diet, as two key areas to tackle in their policy-driven focus on overweight and obesity in young people [4, 174].

Overweight prevalence under the age of 10 years in Kuwait was 31.8%, making it the second highest country in the region [175]. However, the literature search has not found any recent quantitative data to evaluate the prevalence of overweight/obesity and BMI in young people in Kuwait where height and weight were objectively measured and not self-reported. Previous research has shown that young people do not perceive their BMI correctly, particularly when their BMI is classified as overweight and obese [253]. Obese and overweight young people were observed to under-estimate their weight in approximately 50% of boys

and 32% of girls [253]. Hence, while self-reported data on BMI in young people in Kuwait is present, there is a concern of its validity to evaluate the prevalence of overweight/obesity in this population.

The most recent large sample study that objectively measured height and weight in young people in Kuwait was done in 2004. In that study, 30% and 32% of children aged 10-14 were found to be overweight, for boys and girls respectively [4]. Also, 15% of boys and 13% of girls were obese [4]. However, the researchers did not consider which city the young people lived in and pooled data from all cities in Kuwait.

A smaller cross-sectional study conducted on the same age group (10-14) recorded prevalence rates of obesity and overweight at 14.6% and 30.8%, respectively [237]. It also concluded that lack of physical activity and unhealthy eating habits were two causes of obesity and overweight that should be addressed in the studied population [237]. No recent studies were found for young people in older age groups (14 and above) that offered country level, intracity and/or intercity data.

As mentioned in Chapter 3, Kuwait and other Arab countries have conducted the GSHS questionnaire, which provides self-reported overweight and obese rates in young people in school settings. It should be noted that the GSHS does not provide intercity or intracity comparisons and only provides data in limited health parameters at a country level. In the latest GSHS study in Kuwait conducted in 2010 on adolescents aged 13-15 years, the self-reported overweight prevalence was 54.8% and 46.1%, in boys and girls respectively [254]. In addition, the prevalence of obesity was 25.9% in boys and 19.2% in girls [254].

Another urban health issue evaluated in the same GSHS questionnaire was physical inactivity in young people. It was estimated that approximately one fifth of the sample of young people were physically active for the WHO recommended daily 60 minutes on five or more days a week [254]. For girls in Kuwait, it was estimated that only 10% were physically active in those recommended WHO parameters, compared to 30% of Kuwaiti boys [254].

4.7.2 Tobacco Smoking and illicit drug use:

i) Tobacco Smoking:

In 1995, the government of Kuwait approved the Smoking Cessation Legislation (number 15 of 1995), which raised the minimum legal age of smoking tobacco from 18 to 21 [255]. The same law also prohibited smoking in public places and banned all forms of advertising of tobacco products. A penalty of 50 Kuwaiti Dinar (approximately 128 GBP) was placed if any article of the law was broken [255]. Despite this, the Kuwaiti Parliament has recently discussed the failure of the Kuwaiti Government in implementing this law [256].

With the lack of recent studies in tobacco smoking in young people in Kuwait, the availability of data for the Global Youth Tobacco Survey (GYTS), a standardised questionnaire on use of tobacco products in young people aged 13-15 years, has helped provide information regarding this public health issue [257].

The latest GYTS available on the EMRO database is from the 2009 survey, where data from all of Kuwait's cities were pooled together from randomly selected schools in all the five major cities [247]. Therefore, the final report provided a country overview and not data for young people in each city. It should be noted that while the data available has presented a worrying trend of increasing prevalence of self-reported smoking tobacco among young people in Kuwait from 2001 to 2006, with a slight decrease in 2009, it does not provide an insight between intercity and/or intracity differences in tobacco use. Also, it does not provide information on SES and tobacco use in these young people.

In the most recent GYTS report, Kuwait had the highest prevalence of current users of tobacco aged 13-15 in the GCC countries and one of the highest in the Arab States at 25.0% and 11.3%, for boys and girls respectively [257]. Moreover, 11.8% of those aged 13-15 were current shisha smokers (the concept of shisha was explained in Chapter 3) [247]. When asked if they have ever tried smoking cigarettes, 27.6% of the students answered yes, with a higher percentage in boys than girls, at 39.3% and 18.3% respectively [257]. Boys were also more susceptible to start smoking in a year after the survey at 29.7% compared to 24.2% in girls [257]. Approximately half the students have stated that they are exposed to family members smoking in their household [257]. The same proportion of students also expressed being exposed to it in public places [257]. Furthermore, 81.7% stated that they have seen tobacco smoking advertisements a billboard in the past 30 days, despite a Kuwaiti government ban on advertising tobacco products [257].

The GYTS report also stated that almost 60% of the young people surveyed have learnt about the harmful effects of tobacco in school. With regards to cessation, 51.5% of current smokers (52.0% in boys and 47.7% in girls) have expressed a desire to quit [257]. Additionally, 57.8% of the students have stated that they tried to quit in the last year [257].

In terms of access to tobacco products, 57.2% of the students surveyed in the GYTS 2009 purchase them from a supermarket or a convenience store. Despite these students being under the legal age of buying tobacco products in Kuwait, 84.1% of the current smokers reported no difficulties in purchasing their own cigarettes [257].

The final recommendations of the GYTS 2009 stressed on the need of more research to understand the drivers of tobacco smoking in young people in Kuwait [257]. It also advised increasing the funding of research on tobacco smoking young people to follow future trends. Furthermore, it addressed the lack of compliance by the Ministry of Interior in implementing the Kuwaiti law in the sale of tobacco to young people and their exposure to its advertising [257].

ii) Cannabis and other Illicit Drug use

In contrast to the data on tobacco smoking in young people, where some literature exists at a country level, very little is known about the use of illicit drugs in young people in Kuwait. The current Healthcare Legislative Plan highlighted illicit drug use in young people, particularly cannabis use, as part of its central policy despite the lack of evidence of the severity of the urban health issue locally and in the Arab States [4]. It should be noted that illegal drugs are addressed in the Kuwaiti Justice Penal Law number 74 of 1983 and the laws have not been changed since that time. Hence, from a legal standpoint, possession of heroin and cannabis for personal use carries the same legal penalty of a maximum of 2 years in prison and up to 15 years for the sale of illicit drugs [258]. These strict legal issues have been cited as a barrier for health research in illicit drug use in young people [4].

The Ministry of Interior data at the country level has recognised cannabis followed by heroin as the two main two illicit drugs confiscated by police authorities in 2016 [259]. While the grey literature suggests that illicit drug use is a growing problem in young people in Kuwait, particularly in the Bedoon population of Jahra, statistical evidence was not presented for

these claims [260]. Indeed, the annual total number of drug possession offensives recorded in Jahra are approximately 40% higher than Kuwait City from Ministry of Interior data. However, this data does not provide the age of the offenders or a population rate for comparison [259].

Annual number of emergency admissions to secondary care hospitals was higher in Jahra than Kuwait City for drug-related health problems, at 211 and 107 respectively [242]. However, these numbers are not available for different age groups and include all drug-related emergency admissions, including cases of suspected suicide/parasuicide and prescription drug overdose [242]. In Kuwait, there is only one drug addiction and rehabilitation centre, located in Kuwait City, and it treats all the patients in the country, including Jahra [242]. As young people over the age of 12 are classified as adult patients by the Ministry of Health, they are treated in the same drug addiction centre as the rest of the population [244]. Hence, intercity data for illicit drug use and its use in young people are not routinely available from the Ministry of Health.

The Global School-Based Student Health Survey (GSHS), last conducted in 2010 on young people aged 13-15 in Kuwait, provides little insight in the issues of drug use [261]. In that study, 5.7% of boys and 0.4% of girls have stated that they have used “a drug” once or more in the past [261]. However, the question does not specify the type of drug and its legality. The same study also found that 5.0% and 0.7% have used amphetamines at least once in the past, in boys and girls respectively [261]. It should be noted that the GSHS does not provide intercity or intracity comparisons and only provides data at a country level.

The only recent study found in the literature on cannabis use in Kuwait City was on male University students, which found that lifetime prevalence of cannabis use was at 11.0% [265]. Furthermore, the study also found an association between cannabis use and high income, previous family problems and poor high school performance [265]. Similar studies were not found in female students or in Jahra city. The literature search has not produced any intracity studies evaluating other illicit drugs and their use in Jahra and Kuwait City.

4.7.3 General Mental and Psychological Health

As previously stated in Section 4.6, the current Healthcare policy of Kuwait has placed mental health in young people in urban settings as one of its core topics. However, it has not selected a specific field within the mental health spectrum. Instead, it has placed a general emphasis on understanding the interaction between its young population and their city from a psychological and mental health perspective [174]. As with all the other research in young people in Kuwait, the evidence is limited and no research was found directly comparing the mental and psychological well-being of young people in Jahra and Kuwait City.

The most recent GSHS 2011 on young people in Kuwait provides data on several general mental health issues. As previously mentioned, the GSHS does not provide intercity or intracity comparisons [261]. Also, the GSHS questionnaire only provides limited data on mental health issues in young people, such as suicide, loneliness and having close friends, and lacks the details provided by other modalities, for example the Strength and Difficulties Questionnaire used in the URHIS-2 project youth questionnaire [261].

In the GSHS 2011, girls were more likely to feel lonely most of the time compared to boys, at 24.3% and 13.6% respectively [261]. Also, girls reported feeling worried and having difficulty in sleeping in the past year than boys, at 24.6% and 16.2% accordingly [92]. Only 3.3% of the students reported having no friends [261]. More girls reported missing school without permission in the past month than boys, at 62.2% and 53.8% respectively [261].

No gender differences were observed in terms of seriously contemplating suicide, although it was reported by approximately one-fifth of the students [250]. As previously mentioned in Chapter 3 (Section 3.8), suicidal ideation was also relatively high in young people in some Arab countries, at 20.2% and 15.0%, in Oman and Lebanon respectively [191, 192]. These numbers are quite similar to those observed in Kuwait and quite close to the numbers witnessed at a global scale for the GSHS in developing countries. According to Page et al. the average prevalence of contemplating suicide in the GSHS (at a global scale) was approximately 15% [262]. It should be noted that except for Macedonia, no other country in Europe conducts the GSHS. The closest comparable data in Europe could be derived from

the European School Survey Project on Alcohol and Other Drugs (ESPAD) conducted in young people aged 15-16 years. According to Kokkevi et al., the median prevalence of young people frequently contemplating suicide and self-harm was approximately 7% when examining data from 17 European countries in the ESPAD [263]. However, data from the US in young people aged 13-18 years provided values similar to those observed in the GSHS, were 12% were found to have suicidal ideation [264]. With regards to attempting suicide, the data obtained from the Kuwait GSHS 2011 presented a worrying observation, with 16.3% of boys and 18.3% of girls attempted suicide at least once in the past year [250]. To compare, the average lifetime prevalence of attempting suicide for young people in 17 European countries was 10.5% and 4.1% in the United States [263] [264].

Another issue raised by the GSHS 2011 Kuwait data, was the student's perception of lack of support and understanding of their problems from their parents or legal guardian [261]. In this matter, girls perceived less support from their parents or guardian than boys, at 34.5% and 43.6% respectively [261]. While the report acknowledged that some of the results are worrying, it also highlighted the limitations of the survey and the lack of intracity data to understand the situation. Nevertheless, it recognised that anxiety may be higher in girls than boys and recommended further studies in their mental health [261].

Parental attitudes towards mental health, including childhood epilepsy have been reported differently between regions in Kuwait. Jahra residents were more likely to delay medical treatment and seek a traditional and religious remedy, which was rarely reported in Kuwait City [266].

In the most recent study on crime by young males (under 18) reported to the local authorities, more cases of physical violence, rape, stealing, and gang related activity were recorded in Jahra compared to all other cities in Kuwait [267]. Yet, similar studies were not found in girls.

Despite the evidence from other Arab countries of the growing concern of depression and other mental health issues in girls associated with sexual factors, such as early age of marriage in tribal settings like Jahra, little is known of the situation in Kuwait [4]. While the legal age of marriage for girls in Kuwait is 15, there are no studies that observe how early marriage affects their mental well-being and their education status in a traditional,

patriarchal and male-focused society such as that in Jahra. While data from studies in the Arab States on young people highlight gender inequalities, the situation remains unclear in Kuwait City and Jahra [4].

4.8 Study Justification: Summary and Commentary

It is important to highlight that while the government of Kuwait has acknowledged the importance of urban health in young people in its healthcare policy, little is known about the situation at a country and at intracity data comparing Kuwait City and Jahra.

There is evidence from previous research that Jahra is a more deprived and less affluent city than Kuwait City, however it is unclear how this has influenced the urban health of its young people. While research in other Arab countries has shown health and gender inequalities in young people due to social and cultural factors, the picture remains vague in Kuwait due to the dearth of evidence. The tribal background of the inhabitants of Jahra and the complex situation of the stateless people (Bedoon) within its city boundaries are crucial aspects that have not been assessed in an epidemiological intracity comparison with young people in Kuwait City.

The literature search has not found any previous efforts to describe and understand the urban health of young people in an intracity approach between Kuwait City and Jahra. Most of the existing epidemiological research is at the national level with limited intracity and intercity comparisons in the adult population. Despite the government of Kuwait addressing three important urban health aspects in its youth-oriented health policy, the policy was primarily driven by Arab League and WHO recommendations due to the lack of local data on young people. For example, with regards to young people overweight and obesity prevalence rates, the last study objectively measuring height and weight in young people was done in 2004. Subsequent research on young people was conducted through self-reported BMI on young people and no city data were present.

Compared to the overweight/obesity prevalence in young people, while more data exists on tobacco use, there were no studies found in the literature review that compared this urban health issue between young people in Kuwait City and Jahra. This was also observed in general mental health in young people.

5: Aims and Objectives

5.1 Study Aim

To describe and evaluate the main urban health issues in Kuwait City and Jahra, Kuwait in young people (aged 14-16 years).

5.2 Objectives

1) To describe and summarise the urban health profile of the youth population in Kuwait City and Jahra, Kuwait, aged 14-16 years.

2) To describe and evaluate the current situation of the three youth urban health issues highlighted in the current Government of Kuwait Healthcare policy, namely overweight/obesity, tobacco smoking and cannabis use, and psychological distress.

3) To evaluate the association between recognised risk factors of urban living in young people (aged 14-16 years) with the main urban health issues currently highlighted by the Government of Kuwait in their Healthcare policy.

4) To compare urban health issues found in the youth population (aged 14-16 years) of Kuwait City and Jahra, Kuwait with the findings in European cities in the EURO-URHIS2 study in 15 urban health indicators.

5.3 Research Question

What are the main urban health issues and the current situation of public health policy indicators in young people (aged 14-16 years) in Kuwait City and Jahra, Kuwait?

5.4 Study Epistemology

This research will attempt to answer its proposed research question, through scientific, statistical and quantitative methodology. In principal, science and scientific analysis depend on measurable outcomes that are detected through senses [268, 269]. In light of this, this study will be informed by "positivism" in its epistemology, therefore depending on rational thinking and analytical reasoning in its approach [269, 270]. Additionally, using a positivist approach will seek to address the topic objectively, hence reducing any potential personal bias [269, 270].

This study will take an inductive reasoning method as opposed to a deductive approach. As previously mentioned, very little is known about urban health issues among young people in Jahra and Kuwait City, Kuwait and research is limited in the field. While the government of Kuwait has highlighted three key youth public health policy indicators in their current healthcare legislative plan (namely overweight/obesity, tobacco and cannabis use, and general mental health), the choice of them does not appear to be based on existing epidemiological evidence. Even when investigating the health status of young people within the wider context of the Arab States it is difficult to draw hypotheses due to the general lack of epidemiological research in the region. Hence, in order to understand the health status of young people in Kuwait City and Jahra, we would aim to study specific urban health indicators in several dimensions using a standardised tool and from those observations form a general conclusion to explain the current situation in these two cities. The conclusions drawn could in turn offer a better understanding for future research in young people in the Arab States. Thus, inductive reasoning would be an acceptable approach in this situation, in which theoretical evaluations and recommendations are provided after the results are analysed [269, 270].

6: Materials and Methods:

6.1 Study overview

A school based self-completed cross-sectional survey using a multi-stage cluster random sampling method was conducted in the cities of Jahra and Kuwait City, Kuwait.

6.2 Setting and Population

The study was conducted as a cross-sectional survey on female and male students aged 14-16 years old in Kuwait City and Jahra, Kuwait in a classroom setting.

Schools within the boundaries of the cities of Jahra and Kuwait City were randomly selected from a sampling frame obtained from the Ministry of Education (Kuwait). This sampling frame included a list of all the secondary schools within the boundaries of Kuwait City and Jahra (governmental and private), along with their address and contact details.

Secondary schools in Kuwait have a four-academic year system (year 10 -13), with year 11 chosen for the focus of this research as the students in that year are aged between 14 and 16 years old. Except for a few private schools, all governmental schools in the two cities are segregated by sex, with separate schools for boys and girls. The research design and sampling approach is described in detail in Section 6.5

6.3 Materials

6.3.1 EURO-URHIS2 youth protocol and Questionnaire (survey instrument) : Overview, Validation and Piloting

Section Overview :

As this research was connected and part of a larger study (the EURO-URHIS2 project), there is a need to describe the process of validating, translating, piloting the research tools (translated questionnaire) and the methodology used, given the different background and

geographical location of the target population of this thesis compared to European populations.

This section will start by briefly describing the process and development EURO-URHIS2 project and its youth survey. This will be followed by the steps taken to validate, pilot and translate and optimise the Arabic version used in this thesis, as this is the first time the EURO-URHIS-2 youth questionnaire has been conducted in a non-European setting.

The questionnaire used in this cross-sectional study was an Arabic language version of the validated tool used in the EURO-URHIS 2 study on the European youth population (aged 14-16) in 13 European countries, in 33 urban areas. The EURO-URHIS-2 study was conducted to assess and understand the urban health profiles of young people in participating urban areas [271].

Development of the EURO-URHIS2 youth survey :

As previously mentioned in Chapter 2 of this research, the concept of identifying a system for measuring and comparing various indicators of urban health at a European level was first proposed in the EU Public Health Programme in 2005 [146]. In 2006, initial work was started at the University of Manchester, with Dr. Arpana Verma as Principal Investigator, to develop a tool for monitoring urban health [147]. In the first step of this project, entitled EURO Urban Health Indicator System (URHIS) 1, an assessment was made of which European Community Health Indicators (ECHI) were relevant and applicable to urban health [148].

In 2009, EURO URHIS 2 was developed to collect data from heterogeneous European urban areas and to provide methods for assessing and comparing the health of different urban populations [150]. It also aimed to produce validating cross-sectional tools for studying existing data and for future policy from 30 cities in 12 European countries [150, 151]. The EURO-URHIS-2 project had 10 Work Packages (WP) (Table 6.1).

Table 6.1: Work Packages in the EURO-URHIS 2 project [140]

Work Package Code	Description
WP1	Management
WP2	Dissemination
WP3	Evaluation
WP4	Protocols
WP5	Data Collection
WP6	Monitoring
WP7	Development and application of aggregate health policy measures
WP8	Presentation of urban health project results in a website
WP9	Conference on European Urban Health
WP10	Training Workshops

The decision that there was a need for a questionnaire for "young people" was taken as part of the EURO-URHIS 2 in February 2009 after acknowledgement by the research team that different questions to represent UHIs would be needed for adolescents (an important demographic of cities) than those used in the adult populations [152]. A panel with expertise in health surveys of younger people, including with knowledge of the Health Behaviour in School Children (HBSC) survey set, was constructed for the development of the youth survey (questionnaire and methods) for the EURO-URHIS2 project. The panel developed a youth survey questionnaire to represent the core EURO-URHIS UHIs comprising 7 main domains: "demographic, health status, health-related lifestyle factors, social environment, economic and material background, physical environment and access to and use of healthcare

services" [153].

Validated questions to represent the UHIs were sought from previously conducted, validated sources (for example HBSC survey, International Study of Asthma and Allergies in Childhood (ISAAC), European Health Interview Survey Questionnaire (EHIS), Health Related Behaviour Questionnaire (HRBQ), European School Survey Project on Alcohol and Other Drugs (ESPAD), Survey on Income and Living Conditions Questionnaire (SILC) and European Community Respiratory Health Survey (ECRHS) [153]. The youth survey questionnaire was designed to represent the health of 14-16-year-olds and to be self-completed during one school lesson period (taking no longer than 40 minutes). The questionnaire was then translated and back-translated to different languages for the participating European cities. After obtaining representative samples of schools for each urban setting, classroom-based surveys were conducted across 50 cities during 2011. EURO-URHIS2 project completed dissemination of all components of data collection (youths and adult survey, analysis of routinely available data) in 2015 including data from 50 urban areas for young people aged 14-16 years with a total of 13,783 completed and validated youth surveys [153].

The closing conference and final workshop (Workshop F) for EURO-URHIS-2 was held in Amsterdam in September 2012 and attended by the primary researcher of this thesis, in which the methodology and preliminary data in young people in Kuwait City and Jahra was discussed and presented.

Domains in the EURO-URHIS2 youth survey:

The EURO-URHIS-2 project youth questionnaire was developed as a tool to include the most important urban health indicators (UHIs) in young people in seven key areas as described in Table 6.1 [271].

Domain	UHI	Source Material*
Demographics	Sex	Multiple
	Age	Multiple
	Residence (and duration at residence)	Multiple
Social Background	Family affluence scale	HBSC
	Quality of residence	EU SILC
Social context	Communication	HBSC
	Relationship and quality of friendships	HBSC
	Attributes of school life	HBSC
Health outcomes	General health status	Multiple
	Asthma- complaints	ISAAC – child questions
	Rhinitis – complaints	ISAAC – child questions
	Eczema- complaints	ISAAC – child questions
	Injuries	EHIS
	Back Pain	Manchester pain studies
	Mental health	SDQ- Child version
	Somatic health complaints	Manchester Pain studies
	Height and weight	HBSC

Domain (contd.)	UHI (contd.)	Source Material* (contd.)
Health Behaviours	Physical activity	HBSC
	Nutrition	HRBQ
	Oral health	HBSC
	Weight reduction behaviour	HBSC
	Sedentary behaviour – TV	Manchester pain studies
	Sedentary behavior - PC	Manchester pain studies
Risk behaviours	Smoking	HBSC
	Drug use	HBSC/ESPAD
	Bullying	HBSC
Physical environment	Noise	EU SILC
	Pollution	EU SILC
	Crime	EU SILC

**Key: Multiple (various sources); EU SILC: European Union Statistics on Income and Living Conditions; ISAAC: International Study of Asthma and Allergies in Childhood; EHIS: European Health Interview Survey; HRBQ: Health-Related Behaviour Questionnaire; ESPAD: European School Survey Project on Alcohol and Other Drugs; YRBSS: Youth Risk Behaviour Surveillance System*

Table 6.2 Development of the EURO-URHIS-2 project youth questionnaire and source materials in seven key areas for urban health indicators (UHIs). [Source]: Adapted from Pope D, Katreniak Z, Guha J, Puzzolo E, Higgerson J et al., Collecting Standardized urban health indicator data at an individual level for school-aged children living in urban areas: methods from EURO-URHIS2. *Eur J Public Health* 2015 ckv105. doi: 10.1093/eurpub/ckv105

Arabic Questionnaire: Justification, translation, validation and piloting

While this thesis adopts the methods of the adolescent component of EURO-URHIS 2 and also uses its findings to make comparisons with the data collected for this study, additional steps were taken for this research to validate, translate and optimise the use of the EURO-URHIS2 youth survey in Kuwait City and Jahra, Kuwait. These are described in this section.

Since no Arabic language version of the EURO-URHIS 2 youth survey existed, the task of translating the questionnaire had to be partaken as part of this research. An English version of the EURO-URHIS2 youth survey was used as the base material and translated by an officially ISO-certified translator (Trans Perfect), located in London, United Kingdom in September-October 2011 (see Appendix C). Arabic is considered the official language in the State of Kuwait and the main spoken and written language for both Kuwait City and Jahra.

The order of the questions, number of pages and diagrams in the questionnaire were not changed from the original English text version to ensure the existing validity of this tool and to allow future comparison with other urban populations of young people.

To validate the Arabic version of the questionnaire, back-translation (from Arabic to English) was conducted by the primary researcher and this was revised by a panel of public health experts in the Department of Public Health (Kuwait) and as part of the validating and piloting process (see below). The issues raised in the back-translation process were minor and were discussed with a panel of experts in the field of public health in Kuwait (see below).

Initial piloting and back translation:

The first stage of the piloting was done with a group of 10 Kuwaiti University students studying in the UK in November 2011. Seven of the students were from Kuwait City and three were from Jahra. The choice of Kuwaiti students was made due to Arabic being their first language and for their understanding of the local dialect and culture of the country. The rationale behind using older University students for this first stage of piloting was to be able to utilise their English language skills to compare the back-translated version of the questionnaire with the EURO-URHIS2 English version.

The students were presented with the following: the Arabic translated version, back translated version (to English) of the questionnaire, and the original EURO-URHIS2 English language youth questionnaire for 45 minutes. This was followed by a group discussion on the questionnaire with the primary researcher regarding the level of language used, suggested time to complete the questionnaire, and barriers found in using the Classical Arabic terms as opposed to Arabic terms in the local Kuwaiti dialect. Comparisons were made between the two versions (translated and back-translated) to discuss were any changes or errors in the translated version prior to the discussion with the panel of public health experts in January 2012.

Kuwaiti Public Health Expert Panel Meetings:

Two meetings were held between the primary researcher and a panel of public health experts in Kuwait. The rationale for this step was to obtain feedback from local experts in the field of public health and policy in terms of the justification, validation and optimisation of the EURO-URHIS-2 youth survey and its methodology in the cities of Kuwait City and Jahra.

The two meetings were arranged through the office of the Head of the Department of Preventive Medicine Unit at the Ministry of Health, Kuwait (Dr. Jafar Dawood) and took place in January 2012 at the Central Office of the Department of Public Health in Kuwait City, Kuwait. Experts were chosen based on their previous experience in the field of public health and policy in Kuwait and other Arab States as well as their previous research on school-based surveys, including the GSHS in schools in Kuwait. All the experts chosen were fluent in Arabic and English. The local experts that attended both meetings were the following :

1) Dr. Jafar Dawood – Head of Preventive Medicine Unit, Department of Public Health, Ministry of Health, Kuwait
2) Dr. Yousef Mindikar – Head of the Department of Public Health, Ministry of Health, Kuwait
3) Dr. Tariq Abdulaziz – Head of the Environmental Health Unit, Department of Public Health, Ministry of Health, Kuwait

4) Dr Adnan Algharabelly- Head of Chronic Diseases Research Team, Department of Public Health, Ministry of Health, Kuwait
5) Dr Ahmed Reda – Science and Statistics Department, Kuwait University, Kuwait

The first meeting with the panel of Kuwaiti public health experts focused on three topics : the suitability and justification of the use of the EURO-URHIS2 youth survey in Kuwait, back-translation issues, and existing data on young people in Kuwait. In this meeting the experts were presented with a copy of the original EURO-URHIS-2 youth questionnaire, the youth survey operation manual, the Arabic version of the youth questionnaire, and a back-translated version of the Arabic questionnaire (in English).

With regards to the suitability of using the EURO-URHIS-2, the view of the panel was that the methodology and youth questionnaire could be implemented in Kuwait and could be suitable for assessing youth urban health indicators in Kuwait. It was also stated that a more suitable tool was not present for the study population or within the wider context of the Arab States. Additionally, the experts agreed that the current existing data in Kuwait for young people was lacking and could not be used as a comparator with European data.

However, issues were raised in the first meeting with regards to the language used in the Arabic version and the back translation of the questionnaire:

A) The first issue with the language used was that the panel agreed that changes needed to be made for the wording of three of the questions on dietary eating habits from Classical Arabic to terms that suit the local Kuwaiti dialect (question 18). This was modified based on the recommendations of the panel.
B) A key point that was raised in first meeting was on the questions regarding smoking habits. As smoking tobacco through shisha is a cultural and social aspect of Arabic society (as described in Chapter 3), the wording of the questions in the final Arabic version of the questionnaire was decided to be “tobacco smoking” as opposed to “cigarette smoking”. This was to avoid the confusion in excluding tobacco shisha smokers as non-smokers in the sample of young people in this study.

C) Minor modifications were recommended in question 5 (area of residence), were the term used did not reflect the term used in the State of Kuwait.
D) Issues were raised with the back translation with regards to questions on asthma, allergic rhinitis, skin conditions (questions 8,9,10 and 11) and the Strength and Difficulties questions (question 15). The panel viewed the language in the back translation in these questions to differ from the original English text in the EURO-URHIS2 questionnaire. The general overview of the panel was that the back translation used medical terms that were difficult for the students to understand. The decision was made to re-evaluate these questions in the second meeting after the translated Arabic version was modified using simpler terms suitable for the target population.

The agenda of the second meeting with the public health expert panel focused on three topics: the final assessment of the Arabic questionnaire, questions omitted by the Ministry of Education ethics committee, and the suitability of pre-selected urban health indicators used in assessing public health policy indicators in Kuwait City and Jahra.

In the second meeting, the final version of the Arabic questionnaire was approved by the panel of experts after modifications were made following the first meeting. With regards to the questions omitted by the Ministry of Education (see Section 6.4.5), the panel of experts agreed that applying for a second ethical approval by modifying the questions on sexual practices and alcohol would present a challenge in comparing the data with other populations in the future. Hence, the decision was made to continue with the approved questionnaire with the omitted questions.

The final issue discussed in the expert panel meeting were the pre-selected urban health indicators used as independent (explanatory) variables in the multivariate analysis models for policy specific urban health indicators: overweight/obesity, tobacco use, and general mental health. Urban health indicators were discussed in terms of existing epidemiological data in Kuwait, the Arab States or if they have been found to carry a public health significance in the literature on similar population. Using a broad approach as the one described was recommended by the panel due to the limited existing data in the selected population for this thesis. Feedback from the expert panel was taken into consideration in

the final list of pre-selected urban health indicators for the multi-variate analysis of four dependent variables , which will be described in more detail in the statistical analysis section 6.7.

Piloting in classrooms in Kuwait City and Jahra, Kuwait:

This stage of the piloting was conducted in Kuwait between January-February 2012. Four classrooms were selected for this stage: two in Kuwait City and two in Jahra. In each city, one classroom of boys and another of girls were selected. The aim of this step was to determine the average time required by students to complete the questionnaire and to highlight potential difficulties and to identify issues that were missed in the initial piloting stage and translation. In addition, the proposed methodology of measuring height and weight was evaluated.

Student completion time was between 20 and 50 minutes, with the average being approximately 30 minutes for both cities. After completion of the questionnaire, a brief session was conducted with the students to ask for their oral and written feedback on the questionnaire and any difficulties they faced during the process.

Two methods of taking height and weight measurements were tested at this stage of the piloting process. The first involved taking height and weight measurements prior to conducting the survey. While the second method involved the students being selected one after the other to measure their height and weight while they were answering the survey. It was noted that the first method provided a more efficient methodology for the research team and allowed the students to focus more on answering the questions in a shorter time period. Based on these findings, the first method was selected for this research.

6.3.2 Questionnaire printing:

A total of 1300 questionnaires were printed, with the aim of providing 650 questionnaires for each city. This number was higher than the required sample size to account for excluded or omitted questionnaires. Printing was done at the expense of the primary researcher at the Department of Public Health in Kuwait City, Kuwait.

6.3.3 Questionnaire coding and labelling:

The coding system that was followed was similar to the one described in the EURO-URHIS2 Operation Manual: Youth Survey [272]. Each questionnaire was labelled with a code prior to visiting the randomly selected school. One or two classrooms were surveyed per school, and the number of labelled questionnaires was adjusted prior to the visit accordingly. Both cities were coded in different three letter codes as shown in Table 6.2.

The coding system for all surveyed schools in both cities was based on four categories (from first to last): Three letters for the city, school number (2 digits), classroom number (1 or 2), and student number (from 1 to 30). For example in Jahra, for the second school the 5th student in the first class surveyed would have a unique code of JAH-02-01-05. The choice of 30 as the maximum number of students per class was placed as it was the legal upper limit set per class by the Ministry of Education for secondary school students [273].

Table 6.3: Code for each city in the research (Kuwait City and Jahra)

City	Code
Kuwait City	KUW
Jahra	JAH

The final code was written on the first page of each questionnaire and checked after completing the survey in every classroom. This unique code for each student was used in the data entry stage.

6.3.4 Height and weight measurement spreadsheet:

A Microsoft Word spreadsheet in Arabic was provided to the research team for each classroom to record height (in centimetres) and weight (in kilograms). In addition, it contained the date and code for the school and classroom. A copy of this spreadsheet is provided in Appendix H.

6.3.5 Letter to school principals

The letter sent to the school principals included the following:

- the title of the study
- aim and objectives of the research
- The impact this research could have on their urban area and the State of Kuwait
- The proposed date and time of the visit to conduct the survey with an emphasis on flexibility from the side of the research team.
- The need to provide a separate area (if possible) to measure the height/weight of students
- The average time expected for students to complete the questionnaire.
- The contact information and details of the research team
- An emphasis that no personal information would be obtained from the students that could be traced back to them and that they had the right to refuse to participate.

These letters were sent based on the request of The Ministry of Education (Kuwait) through its ethical approval that selected school should be contacted in advance at least 30 days

prior to the survey by a postal letter to their school principal. Details of the ethical approval are provided in Section 6.4.5.

The research team were not required to send letters to the students' parents, as school principals in Kuwait take the obligation of informing the parents of young people in the selected schools of any government approved health research.

6.3.6 Sampling Frame

The sampling frame for this research was obtained from the Ministry of Education (Kuwait). It contained a list of all the secondary schools within the boundaries of Kuwait City and Jahra (governmental and private), along with their address and contact details.

6.3.7 Height/Weight Measuring Equipment

Two Detecto scales (Model 439 Balance Beam Physician Scale with Height Rod, Detecto, USA) were supplied by the Ministry of Health (Kuwait) through its Department of Public Health. These scales were provided for the duration of the study and calibrated/re-calibrated by the Ministry of Health staff after every school to ensure their validity and reliability.

6.4 Cross-sectional Survey Methodology:

6.4.1 Research team personnel:

Six health inspectors (3 females and 3 males) were allocated by the Ministry of Health for this research. This allocation was provided by a formal request from the primary researcher to the Ministry of Health (Kuwait) following ethical approval. Their salaries were covered

through the Ministry of Health's programme for advancement of health scientific research in Kuwait.

The choice of enrolling health inspectors from the Ministry of Health was due to their experience and clearance from the government of Kuwait to work on health research on young people and other vulnerable groups.

All Ministry of Health inspectors are required to update their clearance and security data as part of their employment status. Individuals with a criminal record are not allowed to work as Health inspectors in the State of Kuwait [273].

6.4.2 Research team training:

Three training sessions were conducted with the primary researcher and the rest of the research team at the Department of Public Health in Kuwait City, Kuwait.

In first session, background was provided to the team about the importance of this research, the significance of the EURO-URHIS-2 project in urban areas, and the Arabic version of the questionnaire. This step was done to ensure that all the health inspectors understood the questionnaire carefully and could answer any queries raised by the students during the survey to avoid missing data and confusion. The importance of confidentiality and data protection was also addressed as part of this training session.

The second training session involved a practical demonstration session from a Ministry of Health senior nurse of the height and weight measuring equipment to ensure that all the research team could use it accurately and efficiently. During this session, it was decided that a minimum of three researchers was optimum; the primary researcher and two health inspectors for each randomly selected school.

The third and final session was conducted to ensure that the team understood their specific tasks, and a detailed timetable was provided for the team with the logistics and transport options to and from each randomly selected school.

6.4.3 Cultural and social considerations:

Height and weight measurements of students were done in an empty classroom in order to avoid situations that may cause discomfort and/or sensitivity to the students. Each student was measured separately and not in front of their peers in an empty classroom prior to conducting the questionnaire. In schools where empty classrooms were not available, height and weight measurements were done by measuring each student separately in their classroom prior to conducting the survey while the rest of the class waited in the corridor. After height and weight measurements were conducted for the whole classroom, students were handed a copy of the questionnaire.

Height and weight measurements were conducted by health investigators of the same sex as the students. This was done to avoid any social, religious and cultural issues.

6.4.4 Anonymity and confidentiality

At all stages of the research, the privacy and confidentiality of the data was taken into consideration. Steps were taken during the research team training to ensure that all the health investigators understood the importance of student anonymity. Confidentiality was also addressed in the letter to school principals and to students prior to distributing the questionnaire. Students were informed that their information could not be traced back to them and no identifiable data will exist on the questionnaire. Also, they were assured that their data would only be used for this health research and all the questionnaires and database were only accessible by the primary researcher at the University of Liverpool.

Students were informed of these confidentiality measures to increase the validity of the results by encouraging them to answer correctly and reduce bias. In addition, due to the nature of some of the questions, such as those on tobacco smoking and illicit drug use, it was essential for the students to feel that they could answer the questionnaire truthfully and that would not present them with legal consequences.

The completed questionnaires were labelled with the code mentioned in Table 6.2 and did not contain any personal or identifiable information about the selected students.

6.4.5 Ethical Approval and Considerations:

As with any health-related research on minors, this study required ethical approval in the UK and in Kuwait. These are described below.

Ethnical Approval in the UK:

Ethnical approval to conduct this research was formally obtained from The Faculty of Health and Life Sciences at the University of Liverpool. A letter of this approval is in Appendix B. Also, a formal amendment was submitted to the Black Country Research Ethics Committee as part of the EURO-URHIS-2 project (REC Reference 10/H1202/18) to include the primary researcher of this project and the use of the youth questionnaire. Documentation for this amendment is in Appendix B.

Ethnical Approval in Kuwait:

All health-associated research in Kuwait requires submitting a formal proposal to the Ministry of Health (Kuwait), which acts as the gatekeeper for all health-related research in Kuwait. This proposal had to include a study plan, timeframe and target population. As the study population for this research was young people in a school-based setting, the proposal was forwarded to the Ministry of Education (Kuwait).

Two ethnical approval letters were obtained, one from each of the regional offices of the Ministry of Education in Kuwait City and Jahra. These included the name of the primary researcher and the title of the study with the acknowledgement that the Ministry of Education supports conducting this research. Both approval letters are available in Appendix B (in the original Arabic and translated to English) and these were provided to participating schools.

Question omission by Ministry of Education (Kuwait) Ethical Committee:

At the Ministry of Education, the first ethical committee accepted the proposal but stated that questions on alcohol use and sexual behaviour were to be omitted from the

questionnaire due to cultural and social implications in Kuwait. Efforts from the primary researcher to request inclusion of the questions were not successful. Hence, the decision was made to use the Arabic questionnaire but to exclude the questions on alcohol and sexual relationships that were present in the original questionnaire.

6.4.6 Sample Size Calculation:

The method used to calculate the sample size (number of students per city) was similar to that proposed in the EURO-URHIS2 study, where each UHI could be detected to a prevalence of 10% with 95% confidence interval and a margin of error of 0.03 [271] . Using this approach in the EURO-URHIS2, a minimum of 400 students per city were sampled (with an equal proportion of boys and girls). This method was used to calculate the sample size due to the lack of epidemiological data on young people in Kuwait City and Jahra in a school-based on UHI.

6.5 Research Design

6.5.1 Initial school contact:

All schools in Kuwait City and Jahra were initially contacted by telephone two months prior to conducting the survey. This contact was done by the primary researcher. As the school principal holds the authority to refuse the school taking part, this step was done prior to the process of randomly selecting schools.

All schools agreed to participate with the exception of one school in Kuwait City, which was omitted from the sampling frame and the next stage of school and classroom selection through a multi-stage cluster random sampling method. School principals were sent a copy of the letter in Section 6.3.6 at least 30 days prior to conducting the survey.

6.5.2 Sampling Approach:

All secondary schools in Kuwait, with the exception of some private schools, are segregated by gender. The sampling frame obtained from the Ministry of Education contained all the boys and girls schools in Jahra and Kuwait City. It also included private schools at a secondary level (three in each city). There were no religious schools listed in either city.

A multi-stage cluster random sampling method was used in this research. Schools were randomly selected from the sampling frame from each of the two cities. As mentioned in Section 6.2, all schools in both cities were segregated by sex, therefore schools for boys and girls were randomly chosen. An exception to this was for the three private schools in Kuwait City that offered non-segregated classes of boys and girls, and one school was randomly selected from them. Private schools in Jahra were segregated by sex.

As little is known of the inter-city situation in Kuwait City or Jahra and no deprivation index or similar measures exist in the country, schools were randomly selected from the sampling frame based on their district within their respective cities. For example, if two secondary schools for girls were in the same district of the city and one was chosen, the second girls' school was eliminated in favour of another randomly selected from the remaining schools in another district. The aim of this approach was to achieve a representative sample of young people from all the districts in Kuwait City and Jahra.

As per guidelines for the EURO-URHIS2 youth protocol, in larger schools (>200 students in the grade) two classrooms were selected while one classroom was selected in smaller schools (< 200 students in the grade). Classrooms were randomly selected in each school and were taken as a cluster, in which all students in the class were selected for the survey.

Previous school-based studies in young people in Kuwait have witnessed response rates ranging between 65-95% [259]. Hence, to achieve the minimum sample size desired of 400 students from each city, a target was set for 600 students in each city with an equal number of boys and girls. Details of the schools selected can be found in table 6.4.

Table 6.4: Surveyed schools (governmental and private) in Kuwait City and Jahra for boys and girls. Note: Numbers in brackets represent total in the urban area.

	Kuwait City	Jahra
Surveyed governmental schools for boys (total)	7 (13)	4 (8)
Surveyed governmental schools for girls (total)	7(14)	6(11)
Surveyed mixed gender private schools (total)	1(3)	N/A
Surveyed private schools for boys (total)	N/A	1(2)
Schools that refused to participate (gender)	1(girls)	0

6.5.3 School inclusion and exclusion criteria:

School inclusion criteria:

Schools were included if they:

- Agreed to participate in the survey at the initial contact by the primary researcher
- Were situated within the boundaries of Kuwait City and Jahra

School exclusion criteria:

Schools were excluded if they:

- Were located outside the governorates of Kuwait City and Jahra and/or predominately taught students from outside the sampled cities.

- Were schools designated for specific student needs (such as specialty training schools for handicap and disabled students)

6.5.4 Conducting the cross-sectional survey:

Prior to visiting the school:

As mentioned in Section 6.5.1, telephone calls were made to all selected schools two month prior to the survey, followed by a letter to school principals with the details of the questionnaire, ethical approval and a suggested date.

One week prior to the survey date, school principals were contacted by telephone by the primary researcher to confirm the date and time of the school visit. Also, they were informed that the questionnaire would take a full lesson period (of one hour) and the request of having a separate classroom, nurse office or gym to accommodate for the height and weight measuring equipment. A reminder telephone call was also made on the day of the visit as a final confirmation.

The primary researcher and the allocated health inspectors met at the beginning of each week to discuss and review all the schools that would be visited during that week at the Department of Public Health, Kuwait City. Any previous issues faced by the research team were raised in these meetings. A member from the health inspectors was given the task of ensuring that questionnaires were labelled properly according to the code mentioned in Table 6.2, prior to visiting the school.

Conducting the survey

For each school, three members of the research team were allocated: the primary researcher and two health inspectors. Male health inspectors were allocated to boys' schools and female health inspectors to girls' schools. The survey was carried out between March-May 2012 and was completed in the same study term for all students. This was done

to avoid potential seasonal and other variations (such as exam periods in June) between the responses of participating students.

The research team arrived at the school at least 30 minutes prior to the time of conducting the survey. This was done to ensure that the equipment for height and weight measurement was set up in a suitable place. At all schools, the height and weight measurement equipment provided by the Ministry of Health was used even if the school had their own equipment, to ensure validity.

Before conducting the survey, the primary researcher explained to the students the importance of this research and why their participation is needed. They were also informed that no information can be traced back to them and no personal data will be recorded on their questionnaire. In addition, they were informed that participation was voluntary.

After this verbal introduction by the primary researcher, the students were taken for their height and weight measurements. This was done by two health inspectors, where one measured the height and weight of the students and the second recorded the measurements. The equipment was set up sothat the students could not view their measurements and they were not told of them until after completing the questionnaire. This was done to ensure that this did not influence their answers on questions regarding height, weight and dieting habits. Furthermore, to give students a sense of privacy, weight and height measurements were done with a portable curtain barrier between them and the rest of their peers.

Students who completed their height and weight measurements were given the questionnaire in their classroom. Students who refused to have their height and weight measured were also given a questionnaire if they agreed to participate. Whenever possible, desks were separated to avoid students' influencing each other and discussing questions. At all schools, the classroom teacher was present at all times. However, all questions raised by the students regarding the survey were answered by the research team.

The average time for completing the questionnaire was 30 minutes for both cities, however students were given a maximum of one hour. Students who had completed the survey were allowed to leave the classroom to avoid potentially distracting their peers.

In larger schools that required surveying two classrooms, the same methodology was followed. Therefore, the height/weight measurements and questionnaire in the first classroom were completed and then the second classroom was surveyed.

Steps after survey completion:

Prior to leaving the classroom, students were told their height and weight measurements. This was followed with a brief explanation of BMI and how it is measured in young people.

After completing the survey, the health inspectors and primary researcher reviewed the questionnaire reference numbers and height/weight measurement sheet to confirm that they were correctly labelled. The reference numbers were all written on the front page of the questionnaire prior to visiting the school. All completed questionnaires were placed in a sealed cardboard box with the name of the city, school, date and total number of students surveyed. These were sent to the Ministry of Health (Kuwait City) in a location only accessed by the primary researcher. Later, all completed questionnaires were sent to the UK and stored at the University of Liverpool with no identifiable student data.

6.6 Data Entry and Approach to Analysis

6.6.1 Software for data entry and analysis:

Data from the questionnaires were manually inputted by the primary researcher on Statistical Package for Social Sciences (SPSS) version 20. Questionnaires were stored in a secure location in the University of Liverpool after the data entry stage.

6.6.2 Quality assurance:

Random questionnaire checks were generated electronically to ensure that the data had been inputted correctly. These were generated randomly in approximately 10% of the total number of completed questionnaires.

6.6.3 Exclusion criteria for students in both cities :

The exclusion criteria for student questionnaires was similar to that followed by the EURO-URHIS2 youth protocol. These were as follows:

- Questionnaires that were less than 25% completed
- No age or year of birth stated by the respondent
- If the respondent was not aged between 14 and 16 years of age.
- If the respondent was not living in the designated urban area

Questionnaires that did not meet any of these four criteria were excluded from the data entry stage.

6.6.4 Special considerations at the analysis stage:

Overview:

This section details the methodology used in this research in analysing specific UHIs that required special considerations.

BMI parameters for height and weight measurements:

As children and young people require different methods for calculating body mass index (BMI) than adults, the method presented by Cole et al., was used to calculate BMI for participating students [271]. This method was also used in the EURO-URHIS2 youth protocol for calculating BMI. Data from the previously mentioned study was inputted into SPSS to calculate BMI for each entry using the students' age in months (at the time of the survey) and height in centimetres.

Parameters for underweight, normal, overweight, and obese were obtained from both WHO and the International Obesity Taskforce (IOTF) guidelines [274, 275].

Cut-offs for BMI parameters used in this research according to the IOTF and WHO guidelines were as follows:

- BMI < 18.5 : underweight/thinness
- BMI ≥ 18.5 and < 25 : Normal
- BMI ≥ 25 and < 30 : Overweight
- BMI ≥ 30 : Obese (WHO) and BMI ≥ 30 and < 35 : Obese (IOTF)
- BMI ≥ 35 : Morbidly obese (IOTF only)

Measurement of Strength and Difficulties Questionnaire (SDQ) scores:

In the analysis of this research, questions associated with the SDQ scores were measuring according to the method described by Goodman et al., [276].

A total SDQ score was calculated for each student and scores were divided into two categories based on their score: normal (SDQ score ≤ 20) and abnormal (SDQ score of ≥ 20). The same two categories were also calculated for each student in the five different subsets of the SDQ: emotional problems, conduct problems, hyperactivity, peer problems and pro-social behaviour [276].

Psychosomatic Symptoms:

Psychosomatic symptoms were analysed in terms the proportion of students that self-reported one or more of the following three variables in the past six months: lot of headaches, stomach aches, or sickness. Young people that answer to one or more of the three variables were considered to have self-reported psychosomatic symptoms.

Abdominal pain was also assessed as a potential psychosomatic symptom, and young people that self-reported more than 3 days of abdominal pain in the past month were also assessed.

Self-perceived General Health Status:

In terms of self-perceived general health status, young people were asked "in general, how do they view their health?", to which they could answer in five categories: excellent, very good, good, average, and poor.

The findings were recalculated into two categories for general health: (very) good/excellent and less than good (combining the average and poor categories).

Family Affluence Scale (FAS):

The FAS are a series of questions from the HBSC that were used in the EURO-URHIS2 tool to measure the students' SES. In this research, the method of calculating the FAS for each student was according to that described by WHO HBSC Survey on European countries [277]. FAS was assessed in two methods in this research: as a continuous variable (using FAS scores) and as a categorical variable. As FAS divided into categories could reduce the detail provided by these scores, it was used as a continuous variable in the multiple variate analyses described in Section 6.7.2

FAS was also assessed in categories to provide a comparison with EURO-URHIS-2 data. Through the FAS, students were divided into three categories: low, middle, and high affluence.

The FAS (version II) was measured through four different questions in the survey according to the method described in the HBSC study overview [277]. Students were asked the following questions:

1) "Does your family own a car, a van or a truck?" (Scoring : No = 0, One = 1, Two or more =2)
2) "Do you have your own bedroom?" (Scoring: No= 0, Yes=1)
3) "In the past 12 months, how many times did you travel as a vacation/holiday with your family?" (Scoring: None=0, Once=1, Twice and more=2).
4) "How many computer systems does your family own?" (Scoring: None=0, One=1, Two or more=2).

These scores were combined to give a total FAS score of between 0-7. Students were divided into three categories based on their FAS score: low (0-3), middle (4 and 5), and high (6 and 7) affluence.

Health Outcomes:

i) Bronchial asthma

Students were asked in a series of questions to report on symptoms and signs commonly associated with bronchial asthma. These included the following questions: experiencing a wheeze in the chest in the past, or in the past 12 months, severe wheeze that affected their speech, wheeze during exercise (in past 12 months), non-specific dry cough at night, and a confirmed diagnosis of bronchial asthma. The questions were organised in a manner where if the respondent answered "no" to experiencing a wheeze in the chest in the past, then they would skip the questions on bronchial asthma.

ii) Rhinitis:

Questions on rhinitis examined young people's experience with this condition in the absence of a common cold or flu. Students who answered with a "yes" to ever experiencing "sneezing and nasal blockage in absence of cold and flu" would continue with answering questions on rhinitis, while a "no" would skip the rest of the questions on rhinitis. Questions on rhinitis included: experiencing sneezing and nasal blockage in the absence of cold and flu in the past 12 months, the effect of rhinitis on their daily activity, and experiencing hay fever.

Accidents and Injuries:

Students were asked if they had experienced one of the following accidents that had led to an injury in the past 12 months: i) road traffic accident (RTA), ii) accident at school, iii) domestic and/or recreational accident. In each of these three accident criteria, they were asked if the accident resulted in injury that required medical intervention or if there was no need for any intervention and/or medical advice.

Young people who responded with a “yes” for having a RTA, school, or home/leisure accident in the past 12 months were also asked if this accident was caused by a sport-related incident.

Physical activity:

Physical activity in young people was assessed using two UHIs: 60 minutes of physical activity on a daily basis and vigorous physical activity for ≥ two hours per week.

Students were provided with a paragraph in the questionnaire describing what is meant by the term “physical activity” and “exercise”. Students were then asked to answer with the number of days (in the past week) they engaged in physical activity for more than 60 minutes. Students were then categorised into two groups: those that took part in daily physical activity and those that did not.

Students were also asked the number of hours per week they engaged in physical activity with the six choices: never, half an hour, approximately an hour, 2-3 hours, 4-6 hours, or more than 7 hours. Students that answered “2-3 hours”, “4-6 hours” and “more than 7 hours” were combined and categorised as engaging in vigorous physical activity for ≥ two hours per week.

Oral Health:

In this UHI, young people were asked the number of times they brushed their teeth: more than once a day, once a day, at least once a week (not every day), less than once a week, and never. This UHI was analysed into two categories: regular brushing teeth (more than once a day) and non-regular (once or less a day).

Frequently Watching Television:

Students were asked to write the number of hours and minutes they spend watching television on a typical weekday. Students that self-reported watching more than 2 hours of television on a typical weekday were considered “frequently watching television”.

Nutrition and dietary habits:

Questions in the survey on nutrition and dietary habits were answered in four categories based on the students' consumption of various food items: rarely or never, once a week, on 2 to 3 days a week, and on most days of the week.

The term "regular consumption" was considered when students self-reported consumption of a dietary product on "most days of the week". For fruit and vegetable consumption, "regular consumption" was considered when young people self-reported eating fruits and/or vegetables on most days of the week.

Bullying and bullying others:

Bullying was assessed through two UHIs: the proportion of students that were victims of bullying and those that took part in bullying others.

In order to assess the proportion of students that were victims of bullying, young people were asked to self-report the number of times they were bullied in the past two months, with the following choices: "Never", "around twice in the past 2 months", "two or three times in a month", "once a week", and "several times a week". Students that self-reported being bullied at least twice in the past couple of months were considered victims of bullying.

For students that took part in bullying others, similar choices were also presented when asked to self-report the number of times they took part in bullying others in the past two months. The choice for this question were: "Never", "around twice in the past 2 months", "two or three times in a month", "once a week", and "several times a week". Students that self-reported bullying others at least twice the past couple of months were categorised together to calculate the proportion of young people that bullied others.

Noise and pollution:

Students were assessed in terms of their exposure to noise and the proximity of living close to a busy road.

In the first question regarding exposure to noise, young people were asked if they had experienced "noise from their neighbours and/or street".

The second question on outdoor noise exposure at home evaluated the degree of exposure in the past 12 months in three categories: not exposed, somewhat exposed, and severely exposed. This indicator was dichotomised into two variables: not exposed/somewhat exposed and severely exposed to outdoor noise.

The third question on noise exposure and pollution asked students how far their home was located from a busy road with frequent and/or constant cars passing through it.

6.7 Approach to Statistical Analysis :

Overview:

The methods followed in the statistical analysis of this research are described in this subsection. All the stages and steps of the statistical analysis were conducted by the primary researcher using SPSS software version 20.

The statistical analysis methods used will be outlined based on the chapters in the results section (Chapter 7, 8 and 9), as different methods were conducted in each of the results chapters. As previously mentioned, the results section is divided into three chapters :

Chapter 7 : Presents urban health profiles of Kuwait City and Jahra, Kuwait assessed using univariate comparisons between young people in the two cities. The methodology used is described in Section 6.7.1

Chapter 8 : Presents univariate and multivariate comparisons of priority urban health indicators (UHI) for public health policy in Kuwait City and Jahra. Univariate comparisons for UHI on overweight/obesity, tobacco smoking and cannabis use, and general mental health (assessed using SDQ scores and low back pain) were assessed in this chapter as they were identified as priority UHI for public health policy in Kuwait. The univariate comparisons in this chapter followed the methodology described in Section 6.7.1 and the multivariate analysis process is described in Section 6.7.2

Chapter 9 : Uses the data described in Chapter 7 and 8 for 15 key UHIs to compare the urban health profile data from Kuwait City and Jahra with existing data from 20 European

cities in the EURO-URHIS2 project. These 15 UHI were pre-selected as key indicators by the EURO-URHIS-2 project.

6.7.1 Univariate comparisons for Urban health indicator (UHI) to generate urban health profiles for Kuwait City and Jahra :

For Chapter 7 of the results (first chapter of the results section), UHI data from Kuwait City and Jahra were expressed as proportions with a 95% statistical significance if categorical and as means along with standard deviations for continuous variables (after confirming data were normally distributed). Univariate comparisons for priority UHI for Kuwaiti public health policy are presented in Chapter 8 of the results section were also assessed in the same.

To assess the statistical significance of univariate comparisons, chi-squared tests were applied to categorical UHI variables and UHI were compared between the two cities (and when applicable stratified by sex). Statistical significance was taken at p=0.05 and p-values were adjusted using the Bonferroni correction (see Section 6.7.3). For continuous variables, independent t-tests for comparison of means were used. A complete list of the UHIs assessed as categorical and continuous variables to generate the urban health profiles in the univariate comparisons between young people in Kuwait City and Jahra is available in Appendix E. UHIs that require special consideration at the analysis stage are discussed in Section 6.6.4.

6.7.2 Multivariate logistic regression for Urban health indicator (UHI) in Kuwait City and Jahra :

As previously stated, the multivariate models applied in this research used multivariate logistic regression and are presented in Chapter 8. A total of four multivariate analyses were performed using four outcome (dependent) variables that were considered priority UHIs for public health policy in the Kuwait Healthcare Legislative Plan. The four multivariate models

and the pre-selected independent UHI variables tested in the univariate logistic regression are discussed in this section.

Prior to conducting the multivariate logistic regression analyses in Chapter 8, univariate logistic regression was used to estimate i) the association of explanatory (independent) variables with key outcomes giving the odds ratio for increased/decreased likelihood of the UHI dependent (outcome) variable for a given combination of independent variables and ii) the association of UHI independent variables with indicators of "burden" (dependent variables – e.g. obesity measured using BMI).

As previously mentioned in Section 6.3.1 , independent (explanatory) variables were pre-selected for each dependent (outcome) variable based on existing knowledge and public health importance in the target study population, as well the feedback from public health experts from Kuwait (see 6.3.1).

For all four multivariate regression models, independent and contextual variables were only included in the multivariable logistic regression model if they were associated with the dependent (outcome) variable at $p \leq 0.1$ in the univariate analysis. An exception of this was SES, as it is considered an important confounder and was retained in all four outcome variables in the multivariate analyses even if it was associated with the dependent variable at $p > 0.1$. The method of how SES was calculated and analysed in this research was discussed in Section 6.6.4

Each city was analysed separately in both univariate and multivariable logistic regression modelling. All multivariate analyses were conducted on SPSS version 20 in order to generate an adjusted Odds Ratios (OR) with a 95% Confidence Interval for the selected independent and contextual variables in the four multi-variate models. An adjusted Odds Ratio differs from an Odds Ratio in that it measures the association between a dependent variable and a predictor variable after considering the effect of potential confounding variables. Therefore, multivariable analysis was used to analyse the association of explanatory variables with outcomes independent of potential confounding effects.

The four dependent variables were all analysed as dichotomous variables using binary logistic regression and the multi-variate model was assessed using the Omnibus Test of

Model (a predictive good model taken as significant if $p<0.05$). Therefore, multivariable analysis was used to analyse the association of explanatory variables with outcomes (health and burden) independent of potential confounding effects.

The following are four dependent (outcome) variables were examined in multivariate logistic regression analyses:

A) <u>Obesity (Outcome/Dependent Variable) :</u>

Due to its importance as a public health priority UHI in Kuwait, obesity was analysed as a dichotomous categorical (outcome) variable, with students from both cities categorised as obese/not obese based on the BMI IOTF cut-offs (BMI ≥30) and methodology discussed in Section 6.6.4. As previously mentioned, all height and weight measurements were taken by the research team and cut-offs were generated using SPSS based on the student's age (in years and months).

The pre-selected independent and contextual variables that were analysed in the univariate logistic regression with their association with obesity are presented in Appendix F. SES (as a "potential cofounder") and independent variables that were associated with obesity at $p \leq 0.1$ were included in the multiple regression model.

B) <u>Ever Smoking Tobacco (Outcome/Dependent Variable) :</u>

The second public health priority UHI examined as a dependent variable for multiple logistic regression analysis was tobacco smoking habits, using the UHI "ever smoking tobacco" as a dichotomous categorical variable (yes/no). Students were examined in this variable in terms of them "ever smoking tobacco" in the past, as previously mentioned in Section 6.6.4

Pre-selected independent and contextual variables that were analysed in the univariate logistic regression with their association with "ever smoking tobacco" are presented in Appendix F. SES (as a "potential cofounder") and independent variables that were associated with "ever smoking tobacco" at $p \leq 0.1$ were included in the multiple regression model.

C) Psychological Distress (Outcome/Dependent Variable) :

As general mental health was considered the third public health policy priority in Kuwait, it was assessed using the UHI for psychological distress (denoted by an abnormal SDQ score of ≥ 20) and was used as a categorical variable (abnormal/normal SDQ scores) The method of how SDQ scores were analysed in this research is presented in Section 6.6.4.

Pre-selected independent and contextual variables that were analysed in the univariate logistic regression with their association with psychological distress (an abnormal SDQ score of ≥ 20) are presented in Appendix F. SES (as a "potential cofounder) and independent variables that were associated with psychological distress at $p \leq 0.1$ were included in the multiple regression model.

D) Low Back Pain (Outcome/Dependent Variable) :

Low back pain was examined as an outcome (dependent) variable using multiple logistic regression analysis due to its known public health relevance to general mental health in the study population. Low back pain was analysed as a categorical variable (yes/no) were students were asked if they have experience low back pain in the past month (a diagram with the location of the low back pain was provided in the questionnaire).

Pre-selected independent and contextual variables that were analysed in the univariate logistic regression with their association with low back pain are presented in Appendix F. SES (as a "potential cofounder) and independent variables that were associated with low back pain at $p \leq 0.1$ were included in the multiple regression model.

6.7.3 Efforts to reduce Type 1 errors:

As multiple statistical comparisons were done in this research, there is an increased probability of randomly encountering significant differences if we use a significance (alpha) of p-value ≤0.05 [278]. To reduce the chance of type 1 errors, a statistician at the Department of Statistics and Operations Research at Kuwait University (Professor. Ahmad Soltani) was consulted for the best approach in our research. After reviewing the data, it was advised to use the Bonferroni correction method as the most suitable method for this

research. Adjusted p-values were calculated using the following formula [278]: *Adjusted (corrected) p-values = kp* (where *k* was the number of comparisons done). The Bonferroni correction was used consistently to calculate significant p-values (with $\alpha = 0.05$), and these are provided in the Results chapters tables with corrections calculated for every sub-set in each UHI dimension.

Results Section: Chapter 7, 8 and 9

Results Section Overview:

The results section of this research is divided into three different chapters:

The first chapter of the results (Chapter 7) presents the urban health profiles (urban health indicators) of Jahra and Kuwait City using univariate comparisons between young people in the two cities. The methodology used was previously described in Chapter 6.7.1

The second chapter of the results (Chapter 8) presents univariate comparisons for priority UHI for public health policy in the State of Kuwait (namely overweight/obesity, tobacco smoking and cannabis use and general mental health). It will also present multi-variate logistic regression models with four dependent variables of priority public health policy UHIs. The univariate comparisons in this chapter followed the methodology described in Chapter 6.7.1 and the multivariate analysis process described in Chapter 6.7.2

The final chapter of the results (Chapter 9) uses the youth data obtained in Chapter 7 and 8 from Jahra and Kuwait City to compare with 15 key youth UHIs highlighted in the EURO-URHIS2 project from 20 European cities.

7: Results: Comparisons of urban health profiles for young people in Kuwait City and Jahra, Kuwait

Section Overview:

This section of the results will start with a brief overview of the response rate for this study and will be followed by comparing the urban health profiles for young people in Kuwait City and Jahra in the five urban health domains identified in the EURO-URHIS2 project and included in the questionnaire: i) demographics, ii) social background, iii) health outcomes and health status, iv) health behaviours and risk behaviours, and v) physical environment indicators. These domains will be covered in the sections below.

7.1 Response Rates:

Table 7.1 outlines the total number of questionnaires administered in Kuwait City and Jahra, the exclusion criteria and the valid number of respondents for both boys and girls in both cities. The four exclusion criteria used to calculate the number of valid questionnaires were described in Chapter 6.6.3. Only a small number of students refused to participate in the study; a total of 23 students in Kuwait City (3.7%) and 16 in Jahra (2.6%).

From a crude number of respondents in Kuwait City of 598 students, the total valid questionnaires after applying the exclusion criteria were 530 (264 boys and 266 girls). In Jahra, from a crude number of respondents of 606 students, the number of valid questionnaires was 527 (270 boys and 257 girls). The overall response rates were very high for both Kuwait City (88.6%) and Jahra (86.9%).

Table 7.1: Number of students surveyed in Kuwait City and Jahra, total exclusion, and total number of valid questionnaires for boys and girls.

	Crude no of respondents	<75% completion	No age or gender	Not aged 14-16	Not living in urban area	Total Exclusion (%)	No valid total* (%)	No valid boys	No valid girls
Kuwait City	598	9	4	15	17	45(8%)	530 (88.6%)	264	266
Jahra	606	11	13	27	12	63(11%)	527 (86.9%)	270	257

** Response rate (%) calculated by dividing crude number of respondents by number of valid (total)*

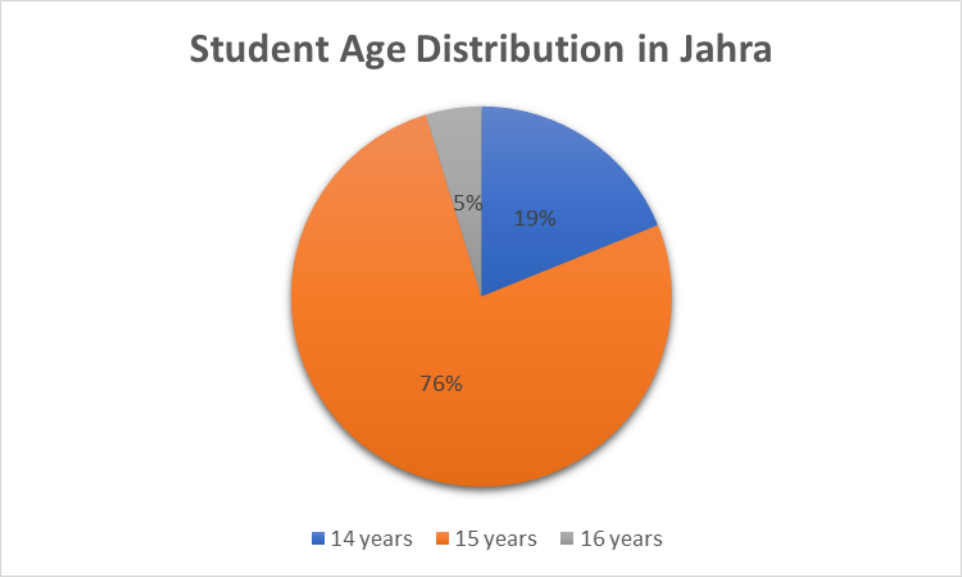
7.2 Demographics of the students surveyed:

Gender:

Table 7.2 shows the total number of respondents from each city based on gender. In Kuwait City, 49.8% and 50.1% of the participating students were boys and girls, respectively. While in Jahra, 51.2% were boys and 48.8% were girls.

Age Distribution:

Figure 7.1 summarises the age distribution for young people surveyed in Jahra and Kuwait City. As previously mentioned in Section 6.2, the selected students were aged 14-16 years old. Most students surveyed were aged 15 years (Jahra = 76%, Kuwait City = 80%).



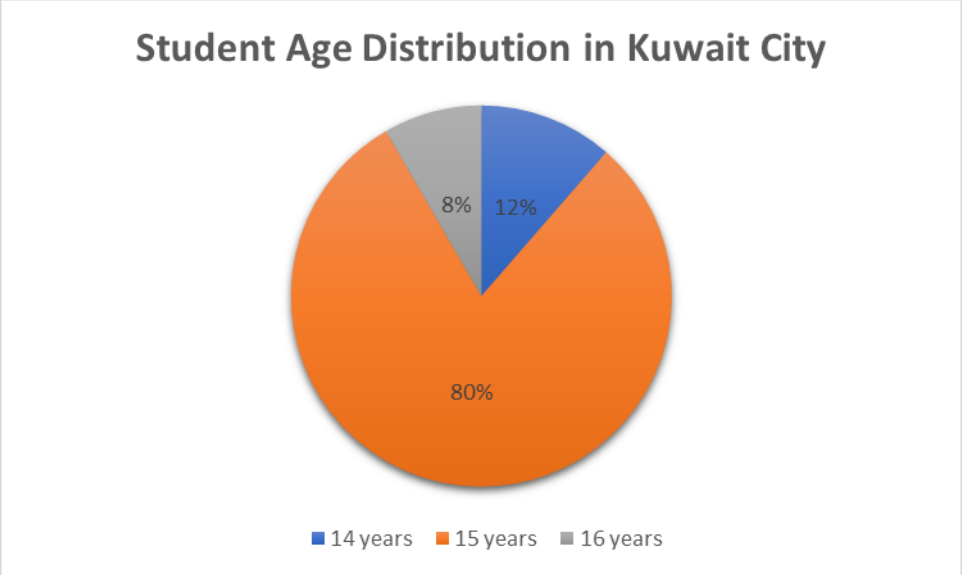


Figure 7.1: Age distribution (in years) for youths in Jahra (top) and Kuwait City (bottom).

Country of Birth:

In both cities, the overwhelming majority of the students were born in the State of Kuwait. The proportion of young people born in Kuwait was 93.2% (n=490) and 94.9% (n=503), in Jahra and Kuwait City, respectively.

Table 7.2: Number of questionnaires in Kuwait City and Jahra, segregated by gender (boys and girls).

City	Number of respondents (total)	Boys (% from surveyed)*	Girls (% from surveyed)*
Kuwait City	530	264 (49.8%)	266 (50.1%)
Jahra	527	270 (51.2%)	257 (48.8%)

**Percentages in brackets for boys and girls indicate their representation from the total number of respondents in each city.*

Duration of Residence:

Overall, most students in both cities have lived for more than ten years in their current home. However, significantly more young people in Jahra have lived in their current home for more than 10 years than those in Kuwait City, at 68.9% and 51.3% respectively ($p<0.001$).

It appeared that students in Kuwait City have lived in their current household for a shorter period of time than those in Jahra. Significantly more young people in Kuwait City (17.2%) reported to have lived in their homes for less than 5 years compared to those in Jahra (10.4%) ($p=0.001$).

7.3 Social Backgrounds

Family Affluence Scale (FAS):

FAS was used as a surrogate for socio-economic status of respondents. The findings for the FAS scores are summarised in Table 7.3.

There appeared to be important socio-economic status differences between the two cities. While Low Family Affluence (FAS II score of ≤ 3) was not widely reported in both cities, it was significantly higher in young people in Jahra (n=50) compared to Kuwait City (n=17), at 9.7% and 3.3% respectively (p<0.001). Similar statistically significant findings were observed when comparing boy and girls with their equivalents in each city.

Additionally, high family affluence scores (FAS II of 6 and 7) were observed to be higher in young people in Kuwait City compared to Jahra, at 66.7% (n=348) compared to 53.9% (n=274), respectively. The same differences in family affluence were also seen when stratifying by gender in each urban area (Table 7.3).

Table 7.3: Family Affluence Scale (FAS II) for young people in Kuwait City and Jahra

Variable	Jahra (n= 527)		Kuwait City (n=530)		p-value
	No.	%	No.	%	
Low family affluence (% of all young people in urban area)	50	9.7%	17	3.3%	< 0.001*
Boys - Low family affluence (% from urban area)	34	12.7%	13	4.9%	<0.001*
Girls - Low family affluence (% from urban area)	16	6.4%	4	1.5%	<0.001**
High family affluence (% of all young people in urban area)	274	53.9%	348	66.7%	<0.001*
Boys- High family affluence (% from urban area)	132	49.3%	168	63.9%	<0.001*
Girls - High family affluence (% from urban area)	142	56.8%	180	69.5%	0.003*

*Key: Low family affluence = FAS II ≤ 3. High family affluence= FAS of 6-7. * p-value statistically significant at p≤0.05/8= 0.006 after adjusting with Bonferroni correction. **(Fisher's Exact test)*

Quality of Residence: Running Water and Hot Water:

Whilst the vast majority of students reported the availability of running water in their homes in both cities, more students in Kuwait City reported the availability of running water in their homes (n=479; 99.2%) compared to Jahra (n=463; 97.7%), although this difference was not statistically significant (p=0.06). A slightly lower proportion of students reported having access to hot water and this proportion significantly differed between cities: Kuwait City (n= 486, 97.6%) compared to Jahra (n=453, n= 93.8%).

Quality of Residence: Availability of a toilet and bath/shower for single household usage:

Young people were asked if their household had a bath and/or shower that was not shared by another family and/or household. Almost all students in both cities reported the availability of a non-shared bath or shower for their household. However, significantly more young people in Kuwait City (n=506; 97.7%) had a non-shared bath/shower compared to Jahra (n=460; 91.3%) (adjusted p<0.001).

Statistically significant differences were also observed for the availability of an internal toilet used by a single family and/or household, which was reported higher in Kuwait City (n=509; 97.7%) compared to Jahra (n=461; 91.1%) (adjusted p<0.001).

Availability of Air Conditioning and Central Heating:

The overwhelming majority of young people reported having an air conditioning system in their homes in both urban areas: in Kuwait City (n= 503; 99.4%) and Jahra (n=487; 98.4%). Access to central heating did differ significantly between cities with a lower proportion being observed in Jahra (Kuwait City n=376; 72.2% compared to Jahra, n=320; 62.6% - adjusted p=0.001).

7.4 Health Outcomes and Health Status:

7.4.1 Self-perceived General Health Status:

The proportion of students who self-reported (very) good and excellent health is shown in Table 7.4, stratified by gender. A higher proportion of students in Kuwait City (n=476; 90.3%) self-reported having (very) good and excellent health compared to Jahra (n=452; 86.4%) (p=0.04). However, when stratifying the results by gender, a significant difference was observed to be exclusively in girls. Approximately 1 in 5 girls in Jahra reported average/poor general health compared to only 1 in 10 from Kuwait City (adjusted p<0.001).

Table 7.4: Students who reported good/very good/excellent health in Kuwait City and Jahra, stratified by gender

Variable	Jahra (n= 527)		Kuwait City (n=530)		p-value *
	No.	%	No.	%	
Self-reported health: Good/ Very good/ excellent (% of all young people in urban area)	452	86.4%	476	90.3%	0.04
(girls) (% in urban area)	203	79.6%	238	90.2%	0.001 **
(boys) (% in urban area)	249	92.9%	238	90.5%	0.31

*Results are displayed for all students, followed by results segregated by gender. *P-values calculated using chi-square test. ** p-value statistically significant at p≤0.05/7= 0.007 after adjusting with Bonferroni correction.*

7.4.2 Psychosomatic symptoms

The proportion of students that self-reported psychosomatic symptoms (students that reported a lot of headaches, stomach aches or sickness in the past six months) is presented in Figure 7.2, stratified by gender.

Overall, psychosomatic symptoms were significantly more common in Jahra (20.5%) than in Kuwait City (12.3%) (adjusted p<0.001). As with self-perceived general health, when stratifying by gender the difference between the two cities was only significant for girls, where girls in Jahra (30.1%) reported significantly more psychosomatic symptoms than in Kuwait City (adjusted p< 0.001).

Additionally, abdominal pain (≥ 3 days in the past month) was reported among more students in Jahra (1 in 5 students) compared to Kuwait City (1 in 7 students) (p=0.03). A similar trend was also observed for headaches (≥ 3 days in the past month), with students reporting them higher in Jahra (23.8%) than in Kuwait City (18.3%).

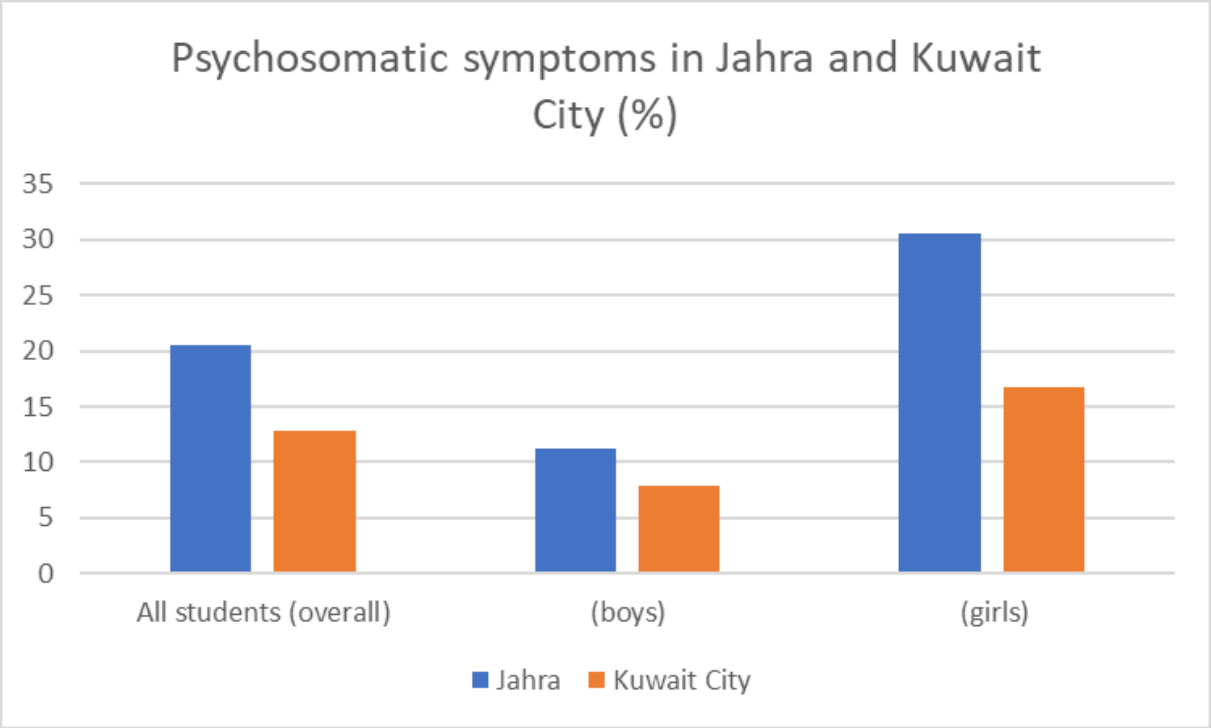


Figure 7.2: Proportions of youths who self-reported psychosomatic symptoms (a lot of headaches, stomach aches or sickness in the past 6 months) in Jahra and Kuwait City (expressed as percentages) presented for overall (all students), boys and girls.

7.4.3 Bronchial Asthma

Wheezing in the chest :

Wheezing in the chest was used as a possible indicator for bronchial asthma. The findings for students who reported experiencing a wheeze in the chest (in their lifetime and in the past 12 months) and those who were diagnosed asthmatics are presented in Table 7.5, stratified by gender.

Overall, a larger proportion of students experienced a wheeze in the chest in Jahra (31.0%) compared to Kuwait City (25.8%), although this was not significant. However, when stratified by gender, more girls in Jahra (29.9%) had experienced a previous episode of a wheeze in the chest than in Kuwait City (21.7%) (p=0.03). Conversely, the proportion of boys who experienced a wheeze in the past was similar in both cities.

Known asthmatic students :

In students who have experienced a wheeze in the chest in the past, 65.6% and 61.2% of them experienced a wheeze the chest in the past 12 months, in Jahra and Kuwait City, accordingly (Table 7.5). The proportion of diagnosed asthmatic students (as a percentage of students who have experienced a wheeze in the past 12 months) was similar in both cities (Kuwait City = 85.3% and in Jahra = 81.7%). A higher proportion of girls were found to be asthmatic in Jahra (84.3%) compared to Kuwait City (73.2%), although this was not significant.

Table 7.5: Students in Jahra and Kuwait City who have experienced a wheeze in the chest in the past and in the last 12 months, and those diagnosed with bronchial asthma.

Variable	Jahra		Kuwait City		p-value *
	No.	%	No.	%	
Ever had a Wheeze:					
Total:	163	31.0%	136	25.8%	0.06
Boys:	87	32.1%	79	29.8%	0.57
Girls:	76	29.9%	57	21.7%	0.03
Wheeze last 12 months: (% within ever had a wheeze)	107	65.6%	82	61.2%	0.42
Diagnosed Asthmatic (% within wheeze in last 12 months):					
Total:	93	85.3%	76	81.7%	0.49
Boys:	50	86.2%	46	88.5%	0.72
Girls:	43	84.3%	30	73.2%	0.19

*Separate results are included for overall (boys and girls), girls, and boys. * P-values calculated using chi-square test.*

Wheezing, dry cough at night and sleep problems:

In terms of the additional burden caused by the symptoms of bronchial asthma, sleep disturbance was commonly reported by the asthmatic students (Table 7.6).

Young people in Jahra reported significantly more sleep problems in the past 12 months caused by their wheezing than those in Kuwait City, at 38.3% and 15.1% respectively (adjusted $p<0.001$). This again was more pronounced in girls in Jahra (36.7%) compared to Kuwait City (14.6%) ($p = 0.02$).

Of students who reported experiencing a wheeze in the past 12 months, more students in Jahra (73.8%) also experienced a dry cough at night compared to Kuwait City (68.8%), although the difference was not significant (Table 7.5).

When stratifying by gender, boys who suffered from a wheeze in Jahra reported the highest proportion of sleep problems due to wheezing at 39.7%, compared to only 15.4% of boys in Kuwait City (p= 0.01).

Wheezing on exertion and speech disturbances :

Experiencing a wheeze during or after exercise was used to assess the additional burden caused by the symptoms of bronchial asthma, the proportion of students that experienced this in both cities is presented in Table 7.6, stratified by gender.

Overall, significantly more young people in Jahra (79.2%) reported an episode of wheezing during or after exercise compared to young people in Kuwait City (59.8%) (p= 0.003). When stratifying by gender, this significant difference was only observed in girls, with a larger proportion of girls in Jahra (75.0%) experiencing a wheeze during or after exercise than in Kuwait City (39.0%) (p=0.001).

The proportion of students who experienced a severe wheeze (in the past 12 months) that limited their speech is shown in Table 7.6.

As with other indicators of bronchial asthma, young people in Jahra (30.8%) who have experienced a wheeze in the past 12 months were more likely to report a wheeze that has limited their speech than those in Kuwait City (19.4%), although this was not significant.

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Table 7.6: Students in Jahra and Kuwait City who have experienced a wheeze in the chest in the last 12 months, those that experienced severely limited speech due to wheezing, and wheezing during/after exercise.

Variable	Jahra		Kuwait City		p-value *
	No.	%	No.	%	
Wheeze last 12 months: (% within ever had a wheeze)	107	65.6%	82	61.2%	0.42
Dry Cough at night: (% from wheeze last 12 months)	79	73.8%	64	68.8%	0.43
Wheeze causing sleep problems at least once a week (% within wheeze in last 12 months):					
Total:	41	38.3%	14	15.1%	**< 0.001 ****
Boys:	23	39.7%	8	15.4%	0.01
Girls:	18	36.7%	6	14.6%	0.02
Wheeze that severely limited speech (% within wheeze in last 12 months):					
Total:	33	30.8%	18	19.4%	0.06
Boys:	17	29.3%	10	19.2%	0.22
Girls:	16	32.7%	8	19.5%	0.16
Wheeze during/after exercise (% within wheeze in last 12 months):					
Total:	84	79.2%	55	59.8%	**0.003 ****
Boys:	48	82.8%	39	76.5%	0.41
Girls:	36	75.0%	16	39.0%	**0.001 ****

Separate results are included for overall (boys and girls), girls, and boys. P-values calculated using chi-square test. ** = p-value statistically significant at p≤0.05/15= 0.003 after adjusting with Bonferroni correction.*

7.4.4 Rhinitis and “hay fever”

The proportion of students who reported suffering from rhinitis and “hay fever” are presented in Table 7.7, stratified by gender.

Rhinitis was widely reported in students in both cities. As with other health outcomes in this study, significantly more young people reported suffering from rhinitis in Jahra (59.4%) compared to Kuwait City (50.3%) ($p=0.003$). Additionally, the burden of rhinitis, such as eye symptoms (itchy and tearing eyes), were found to be significantly higher in Jahra compared to Kuwait City, at 70.1% and 54.2% respectively ($p<0.001$). Even when stratifying by gender, the proportion of students who reported eye symptoms accompanying rhinitis were higher in Jahra for both boys (Jahra = 67.2%, Kuwait City 49.0%) and girls (Jahra= 73.0%, Kuwait City = 59.1%).

With regards to the burden of rhinitis on everyday activity, a sizable proportion of youths in both cities who suffered from rhinitis in the past 12 months reported that it moderately affected their everyday activity (Kuwait City = 46.3% and Jahra = 42.2%).

Interestingly, when students were asked specifically about “hay fever” as a condition, more self-reported suffering from “hay fever” in Kuwait City compared to Jahra, at 37.7% and 30.5% respectively. As with rhinitis, more girls reported an episode of “hay fever” than boys in both cities (Table 7.7). The greatest proportion of students reporting hay fever by gender was girls in Kuwait City (40.1%), followed by girls in Jahra (37.5%), with boys reporting lower proportions in both cities. Significantly more boys reported an episode of hay fever in Kuwait City (35.4%) than Jahra (24.0%) ($p=0.003$).

Table 7.7: Self-reported rhinitis and hay fever in young people in Jahra and Kuwait City, stratified by gender

Variable	Jahra		Kuwait City		p-value*
	No.	%	No.	%	
Ever suffered from hay fever (% of all young people in urban area)	158	30.5%	194	37.7%	0.01
Girls - Ever Suffered from hay fever (% in urban area)	94	37.5%	103	40.1%	0.54
Boys - Ever Suffered from hay fever (% in urban area)	64	24.0%	91	35.4%	0.003 **
Ever suffered from rhinitis (% of all young people in urban area)	309	59.4%	264	50.3%	0.003 **
Rhinitis past 12 months (% from ever suffered from rhinitis)	246	82.3%	209	78.9%	0.31
Girls - Rhinitis past 12 months (% from ever suffered from rhinitis)	119	81.5%	107	77.5%	0.41
Boys - Rhinitis past 12 months (% from ever suffered from rhinitis)	127	83.0%	102	80.3%	0.56
Rhinitis moderately affecting daily activity in the past 12 months (% from ever suffered from rhinitis)	118	46.3%	86	42.2%	0.38
Eye symptoms with rhinitis in past 12 months (% from ever suffered from rhinitis)	178	70.1%	115	54.2%	<0.0001 **
Girls – Eye symptoms with rhinitis in past 12 months (% from ever suffered from rhinitis)	90	73.2%	65	59.1%	0.02
Boys – Eye symptoms with rhinitis in past 12 months (% from ever suffered from rhinitis)	88	67.2%	50	49.0%	0.01

*Separate results are included for overall (boys and girls), girls, and boys. * P-values calculated using chi-square test. ** = p-value statistically significant at p≤0.05/15= 0.003 after adjusting with Bonferroni correction.*

7.4.5 Eczema and skin complaints:

The proportion of students who self-reported eczema and experiencing an itchy skin rash are presented in Table 7.8, stratified by gender.

Overall, the proportion of students who reported experiencing an itchy skin rash in their lifetime was similar in both cities (Kuwait City = 11.2% and Jahra= 14.7%). However, when stratifying by gender, more girls in Jahra (20.1%) experienced an itchy skin rash in the past compared to Kuwait City (11.4%) (p=0.01). Also, no significant differences were observed between boys.

More young people reported an episode of itchy skin rash in the past 12 months in Jahra compared to Kuwait City, at 76.0% and 69.5% respectively, although this was not statistically significant (Table 7.8).

60.0% and 50.1% of students who suffered from an itchy skin rash reported sleeping problems at least once a week due to their condition, in Jahra and Kuwait City accordingly. No significant difference was observed between the two urban areas (p=0.33).

In both cities, eczema was reported by a considerable proportion of students. However, in contrast to most health outcomes in this study, the proportion of young people who reported suffering from eczema was significantly higher in Kuwait City (29.9%) compared to Jahra (20.2%) ($p<0.001$) (Table 7.8). The highest proportion of eczema was reported by girls in Kuwait City (32.3%) followed by boys in Kuwait City (27.5%).

When stratifying by gender, girls in Kuwait City (32.3%) reported a higher prevalence of eczema than those in Jahra (22.4%). The same trend was observed comparing boys, with more boys reported suffering from eczema in Kuwait City (27.5%) than in Jahra (18.2%).

Table 7.8: Young people in Jahra and Kuwait City who reported itchy skin rash and eczema, stratified by gender

Variable	Jahra		Kuwait City		p-value *
	No.	%	No.	%	
Ever suffered from itchy skin rash :					
Total:	77	14.7%	59	11.2%	0.09
Boys:	26	9.6%	29	10.9%	0.62
Girls:	51	20.1%	30	11.4%	0.01
Suffered from itchy skin rash in the past 12 months : (% from ever suffered from itchy skin rash)	57	76.0%	41	69.5%	0.40
Ever suffered from ezcema :					
Total:	104	20.2%	155	29.9%	**<0.001 ****
Boys:	48	18.2%	72	27.5%	0.01
Girls:	56	22.4%	83	32.3%	0.01

*Separate results are included for overall (boys and girls), girls, and boys. * P-values calculated using chi-square test. ** p-value statistically significant at p≤0.05/15= 0.003 after adjusting with Bonferroni correction.*

7.5 Health Behaviours and Risk Behaviours

7.5.1 Oral Health

Regular tooth brushing (at least twice a day) was used to assess oral health in both cities. The proportion of students who self-reported regularly brushing their teeth is shown in Figure 7.3, stratified by gender.

Inadequate oral health appeared to be widely reported in both cities, particularly in boys. However, there were significant differences between the two cities, as more students reported brushing their teeth regularly (at least twice a day) in Kuwait City (61.0%) compared to Jahra (42.2%) (adjusted p<0.0001). When the findings were stratifying by gender, a significantly lower proportion of boys (23.4%) in Jahra reported brushing their teeth regularly compared to Kuwait City (47.2%) (adjusted p<0.001). This significant difference between the two cities was also observed in girls (Jahra = 47.2%, Kuwait City = 75.1%) (adjusted p< 0.001). In both cities, inadequate oral health was reported as being more prevalent among boys than girls.

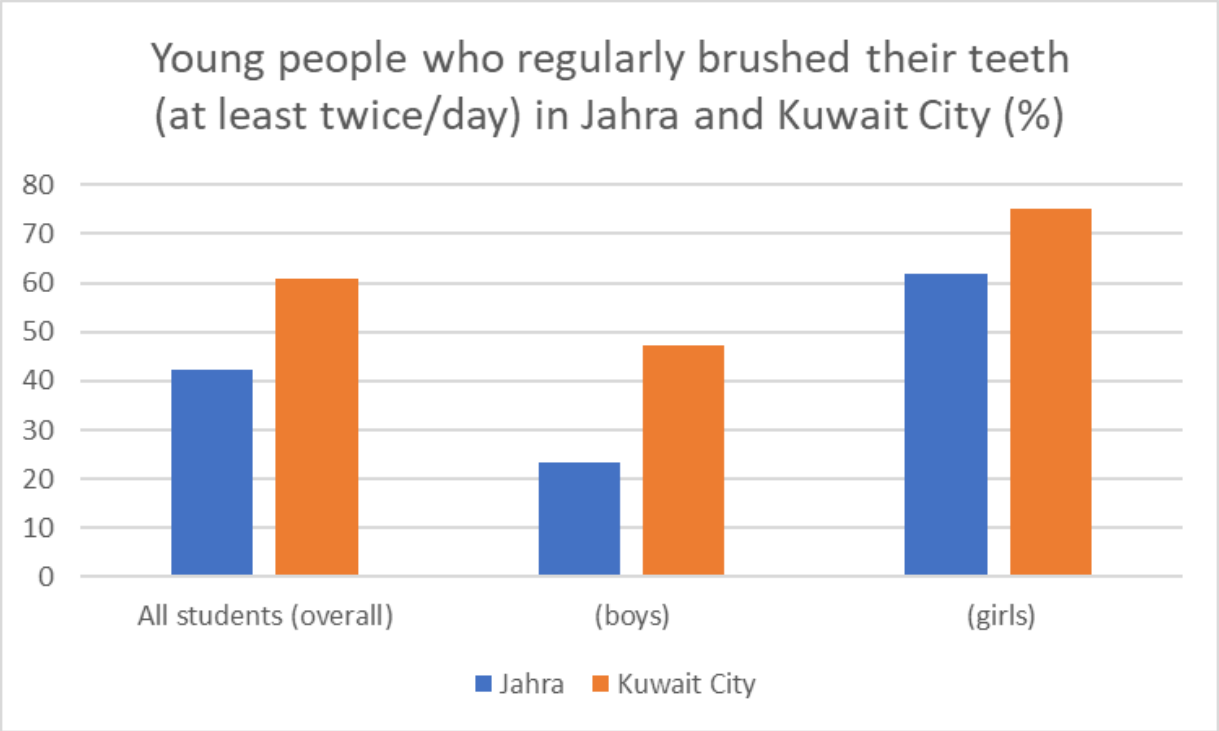

Figure 7.3: Regular teeth brushing (at least twice per day) for youths in Jahra and Kuwait City (expressed as percentages) presented for overall (all students in urban area), boys and girls.

7.5.2 Frequent Television Watching:

The proportion of students who self-reported watching television for more than 2 hours (on weekdays) is shown in Table 7.9, stratified by gender.

Significantly more students in Jahra watched television for more than two hours on weekdays than those in Kuwait City, at 57.9% and 49.8% respectively (p=0.009) (Table 7.11). Moreover, significantly more girls in Jahra (60.3%) reported watching television on weekdays for more than two hours than in Kuwait City (47.7%) (p=0.004).

Table 7.9: Frequent television watching in Jahra and Kuwait City, stratified by gender

Variable	Jahra		Kuwait City		Chi-Square	df	p-value *
	No.	%	No.	%			
Frequently watching television > 2 hours on weekdays :							
Total:	298	57.9%	258	49.8%	6.75	1	**0.008 ****
Boys:	146	55.5%	134	51.9%	0.67	1	0.41
Girls:	152	60.3%	124	47.7%	8.21	1	**0.004 ****

*Separate results are included for overall (boys and girls), girls, and boys. * P-values calculated using chi-square test. ** p-value statistically significant at p≤0.05/5= 0.01 after adjusting with Bonferroni correction.*

7.5.3 Physical activity:

Physical activity was assessed through two indicators: vigorous physical activity for ≥ 2 hours/week and 60 minutes of daily physical activity, the proportion of students who reported both indicators is shown in Figure 7.4, stratified by gender.

In both cities, most students did not participate in vigorous physical activity for ≥ 2 hours/week outside school. However, more young people in Jahra (32.0%) reported taking part in vigorous physical activity than in Kuwait City (25.4%). When stratifying by gender, it appeared that a larger proportion of boys participated in vigorous physical activity than girls in both cities. Vigorous physical activity was reported highest in boys in Jahra (46.2%) compared to only 17.1% of girls in Jahra.

Daily physical activity (of at least 60 minutes, as recommended by the WHO) was reported by only a small minority of students in both cities. Only 9.0% (Jahra) and 7.8% (Kuwait City) of students reported engaging in 60 minutes of daily physical activity in the past week.

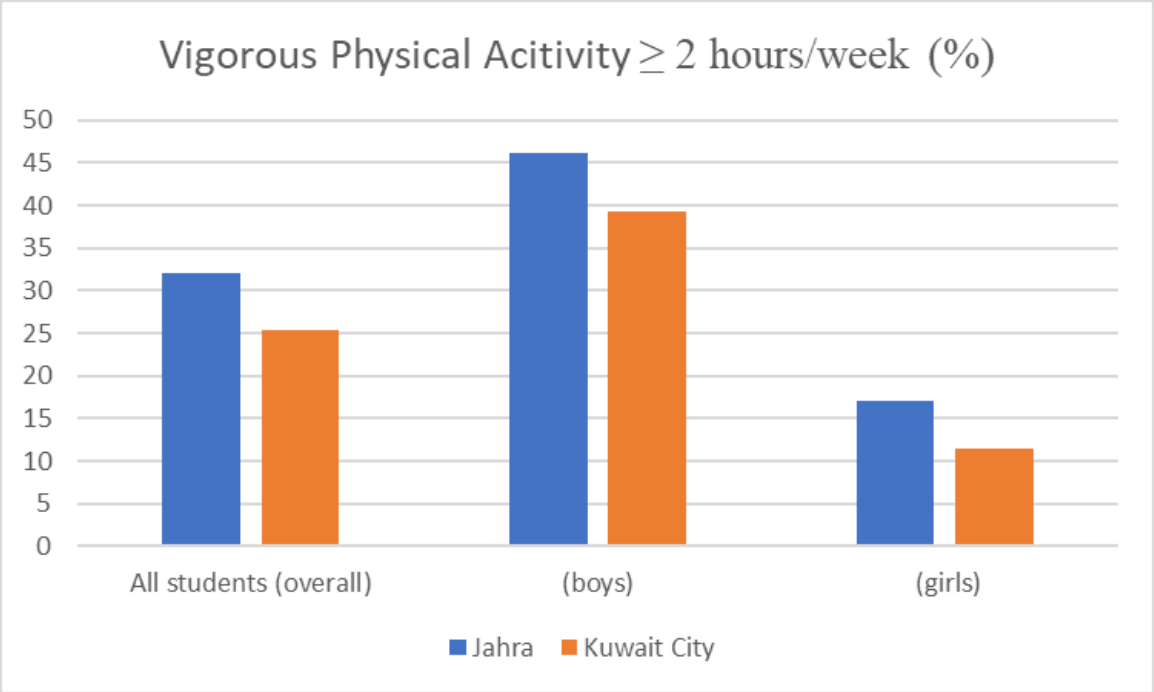

Figure 7.4: Proportions of youths who self-reported vigorous physical activity ≥ 2 hours per week in Jahra and Kuwait City (expressed as percentages) presented for overall (all students), boys and girls.

7.5.4 Nutrition and dietary urban health indicators:

Regular fruit consumption:

The proportion of students who reported regular fruit consumption (on most days of the week) is shown in Table 7.10.

Regular fruit consumption appeared to be low in both cities. Overall, the proportion of students who ate fruit on most days of the week was 29.8% and 33.8%, in Jahra and Kuwait

City respectively. No statistically significant differences were observed between the two cities, even when stratifying the findings by gender. The proportion of students who consumed fruit regularly was found to be quite similar in boys (Kuwait City = 35.5%; Jahra = 28.5%) and girls (Kuwait City= 32.1%; Jahra = 31.1%) in both cities.

Regular vegetable/salad consumption:

The proportion of students who reported regular vegetable/salad consumption (on most days of the week) is presented in Table 7.10, stratified by gender.

In both cities, vegetable consumption was low with less than half of the students reporting regular salad and/or vegetable consumption on most days of the week. A higher proportion of students in Jahra (48.2%) ate vegetables and/or salads on most days of the week than in Kuwait City (42.0%) (p= 0.04). When stratifying by gender, the difference in vegetable and/or salad consumption was observed more prominently in girls (Kuwait City= 42.6%; Jahra= 51.6%) (p=0.05).

Table 7.10: Regular fruit consumption and salad/vegetable consumption (on most days of the week) in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square	df	p-value *
	No.	%	No.	%			
Regular fruit consumption (on most days of the week):							
Total:	155	29.8%	178	33.8%	1.96	1	0.16
Boys:	76	28.5%	94	35.5%	3.00	1	0.08
Girls:	155	29.8%	178	33.8%	0.06	1	0.82
Regular vegetable/salad consumption (on most days of the week):							
Total:	253	48.2%	222	42.0%	4.12	1	0.04
Boys:	122	45.4%	110	41.4%	0.87	1	0.35
Girls:	131	51.2%	112	42.6%	3.84	1	0.05

Separate results are included for overall (boys and girls), girls, and boys. P-values calculated using chi-square test. p-value statistically significant at p≤0.05/19= 0.003 after adjusting with Bonferroni correction.*

Fizzy and low calorie drinks:

The proportion of students who consumed fizzy and low calorie drinks regularly (on most days of the week) is shown in Figure 7.5 and 7.6, stratified by gender.

Regular consumption of fizzy calorie drinks appeared to be more widespread in Jahra than in Kuwait City (Figure 7.5). The proportion of students who consumed fizzy drink regularly was significantly higher in Jahra compared to Kuwait City, at 58.7% and 33.1% respectively (adjusted $p < 0.001$). This significant difference between the two cities was also observed when stratifying by gender. A significantly larger proportion of girls (51.7%) and boys (65.7%) in Jahra regularly consumed fizzy drinks compared to girls (28.2%) and boys (37.9%) in Kuwait City (adjusted $p<0.001$).

Regular consumption of low calorie drinks also presented a similar trend (Figure 7.6), with the proportion of students who reported regular consumption higher in Jahra (22.8%) than in Kuwait City (16.7%).

Even when combining regular consumption of fizzy drinks and low calorie drinks (Figure 7.6), the proportion of students in Jahra (63.1%) who consumed them on a regular basis remained significantly than in Kuwait City (40.2%) (adjusted $p<0.001$).

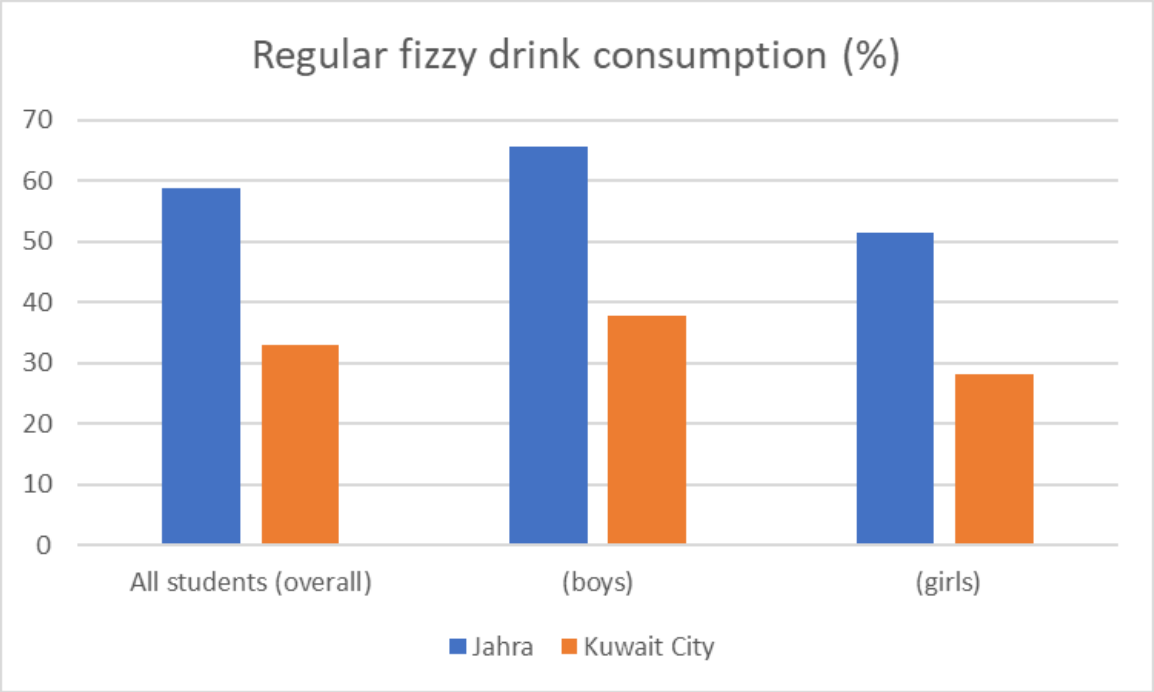

Figure 7.5: Proportions of youths who self-reported regular fizzy drink consumption (on most days of the week) in Jahra and Kuwait City (expressed as percentages) presented for overall (all students), boys and girls.

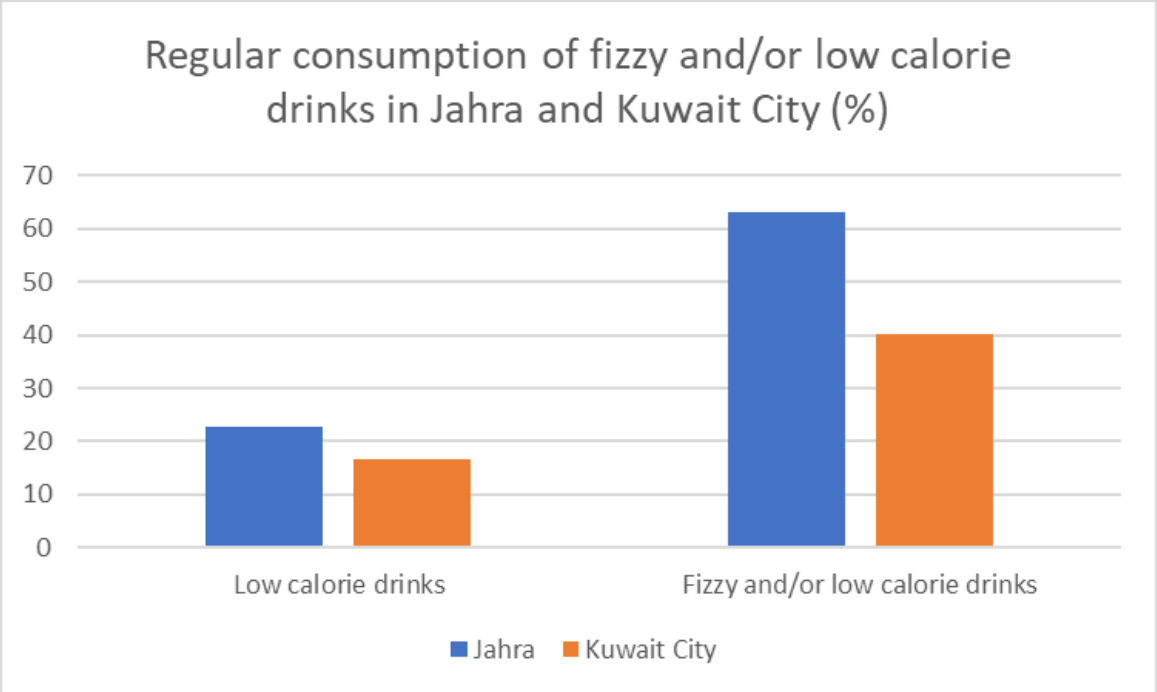

Figure 7.6: Proportions of youths who self-reported regular low-calorie drinks consumption (on most days of the week) and fizzy and/or low-calorie drinks in Jahra and Kuwait City (expressed as percentages) presented for overall (all students), boys and girls.

Meat, fish, dairy produce and vegetable-based protein consumption:

The consumption of protein (animal and vegetable-based) and dairy produce in both cities is shown in Table 7.11.

Both cities showed a similar pattern in their consumption of meat, fish and diary produce. Approximately 1 in 4 students in Jahra and Kuwait City consumed (any) meat on most days of the week. In terms of fish consumption, roughly 1 in 3 students rarely or never ate fish in both cities. Conversely, only 14.7% and 11.4% of students rarely/never ate any type of meat in Jahra and Kuwait City accordingly.

Regular dairy produce consumption appeared to be high in both cities, where approximately 2 in 3 students consumed dairy produce on most days of the week.

In contrast to consumption of other forms of protein, which were similar in the two cities, there were significant differences reported in vegetable-based proteins (such as soya, legumes and beans). A larger proportion of students in Kuwait City reported consuming vegetable-based proteins on a weekly basis than in Jahra, at 60.7% and 54.4% respectively.

Table 7.11: Meat, fish, dairy produce and vegetable-based protein consumption in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square	df	p-value *
	No.	%	No.	%			
Meat (any) on most days of the week: (% all students in urban area)	131	25.0%	140	26.6%	0.38	1	0.54
Rarely/never eat any meat: (% all students in urban area)	77	14.7%	60	11.4%	2.50	1	0.11
Rarely or never eat fish: (% all students in urban area)	185	35.5%	172	33.0%	0.76	1	0.38
Regular dairy produce consumption: (% all students in urban area)	328	63.4%	348	66.5%	1.10	1	0.29
Never or rarely consume dairy produce: (% all students in urban area)	37	7.2%	24	4.6%	3.11	1	0.07
Vegetable-based proteins at least once a week: (% all students in urban area)	274	54.4%	312	60.7%	4.18	1	0.04
Vegetable-based proteins on most days of the week: (% all students in urban area)	78	15.5%	60	11.7%	3.14	1	0.08

Separate results are included for overall (boys and girls), girls, and boys. P-values calculated using chi-square test.*

Carbohydrate-rich food products:

The consumption of various carbohydrate-rich food products in both cities is presented in Table 7.12.

There appears to be different dietary patterns between the two cities in terms of several carbohydrate-rich food products. Significantly more students in Jahra (1 in 4 students) reported eating sugar-coated cereals on most days of the week compared to 1 in 6 students in Kuwait City ($p<0.001$). Stratifying by gender, regularly eating sugar-coated cereal was also higher in Jahra (boys= 23.1%, girls = 29.8%) compared to Kuwait City (boys= 16.5%, girls = 15.6%)

Consumption of starch-rich food products, such as chips and crisps, was also significantly higher in Jahra compared to Kuwait City, with 51.2% of students in Jahra reporting consuming crisps on most days of the week compared to 36.5% in Kuwait City ($p<0.001$). Also, a significantly greater proportion of students ate chips (French fries) and/or roast potatoes on most days of the week in Jahra (41.6%) than in Kuwait City (32.8%) ($p=0.003$). Interestingly, regular consumption of chips and/or roast potatoes appeared to be higher for girls (Jahra = 46.2%, Kuwait City= 36.6%) in both cities compared to boys (Jahra = 37.1%, Kuwait City = 29.1%).

Whilst consumption of wholemeal bread appeared low in both cities, there was a significant difference in its consumption between the two cities. A significantly greater proportion of students in Jahra (64.8%) rarely or never ate wholemeal bread compared to Kuwait City (49.0%) ($p<0.001$). When stratified by gender, the findings for rarely/never eating wholemeal bread appeared to show a similar trend when comparing the two cities (Jahra boys = 62.6%, girls =66.9%; Kuwait City boys= 50.2%, girls = 47.9%).

With regards to eating chocolates and/or sweets, regular consumption was high in both cities, with more than half of the students reported consuming chocolates and/or sweets on most days of the week (Jahra= 60.0%; Kuwait City=55.7%). Regular consumption of chocolates and/or sweets was slightly higher in girls (Jahra = 64.6%, Kuwait City = 61.3%) compared to boys (Jahra = 55.8%, Kuwait City= 50.2%) in both cities.

Table 7.12: Carbohydrate-rich foods consumption in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square Value	df	p-value *
	No.	%	No.	%			
Sugar coated cereals on most days of the week (% all students in urban area)	132	25.8%	83	16.0%	14.97	1	**<0.001****
Rarely/never eat high fibre cereal (% all students in urban area)	267	52.8%	265	50.9%	0.37	1	0.54
Chocolates/sweets on most days (% all students in urban area)	313	60.0%	293	55.7%	1.95	1	0.16
Crisps on most days (% all students in urban area)	266	51.2%	190	36.5%	22.56	1	**<0.001****
Chips and/or roast potatoes on most days (% all students in urban area)	215	41.6%	173	32.8%	8.57	1	**0.003 ****
Wholemeal bread on most days of the week (% all students in urban area)	68	13.4%	89	17.4%	3.13	1	0.08
Never/rarely eat wholemeal bread (% all students in urban area)	329	64.8%	251	49.0%	25.76	1	**<0.001****

Overall results for boys and girls in each city. P-values calculated using chi-square test. ** p-value statistically significant at p≤0.05/19= 0.003 after adjusting with Bonferroni correction*

7.6 Physical Environment indicators

Noise and pollution:

The proportion of students that reported exposure to noise in their home and living near a busy road is shown in Table 7.13 for both cities, stratified by gender.

Noise pollution appeared to be widely reported by students in both cities, with most students reporting exposure to noise from their neighbours and/or street. However, a significantly larger proportion of students in Jahra (71.6%) reported exposure to noise compared to Kuwait City (57.3%) (p=0.001). This significant difference was also observed when stratifying exposure to noise by gender in both cities.

In terms of exposure to severe noise in the past 12 months, more young people in Jahra (13.1%) reported exposure to severe noise compared to Kuwait City (8.4%).

With regards to living near a busy road, more students in Jahra (56.4%) lived in homes located 50 metres or less from the nearest busy/frequent road compared to Kuwait City (49.5%). Conversely, a larger proportion of students in Kuwait City (28.2%) lived in homes located more than 150 metres away from the nearest busy/frequent road compared to Jahra (23.4%), although these results were not statistically significant.

Table 7.13: Young people in Jahra and Kuwait City and exposure to outdoor noise (at home) and the distance their home is located from a busy/frequent road.

Variable	Jahra		Kuwait City		p-value *
	No.	**%**	**No.**	**%**	
Experienced outdoor noise (at home):					
Total:	371	71.6%	302	57.3%	**< 0.001 ****
Boys:	183	68.3%	143	54.0%	**<0.001 ****
Girls:	188	75.2%	159	60.7%	**< 0.001 ****
Exposure to severe noise in the past 12 months : (% of all young people in urban area)	68	13.1%	44	8.4%	0.01
Home - 50 metres or less from nearest busy road (% in urban area)	285	56.4%	256	49.5%	0.03
Home – 150 metres or more from nearest busy road (% in urban area)	118	23.4%	146	28.2%	0.07

*Overall results for boys and girls in each city *P-values calculated using chi-square test ** p-value statistically significant at p≤0.05/14= 0.004 after adjusting with Bonferroni correction*

Crime, violence and vandalism in urban area:

The proportion of students that reported crime, violence and vandalism in their urban area is presented in Figure 7.7 for both cities, stratified by gender.

Crime, violence and vandalism appeared to be more of an issue in Jahra than in Kuwait City. Significantly more young people in Jahra (28.3%) reported crime, vandalism and violence in their area than in Kuwait City (10.8%) (adjusted p<0.001). Even when stratifying the findings by gender, girls (22.6%) and boys (33.6%) in Jahra were significantly more likely to report

their area to have crime than girls (8.0%) and boys (13.6%) in Kuwait City (adjusted p<0.001). Also, in both Jahra and Kuwait City, the proportion of boys that reported crime in their area was higher than girls in the same city.

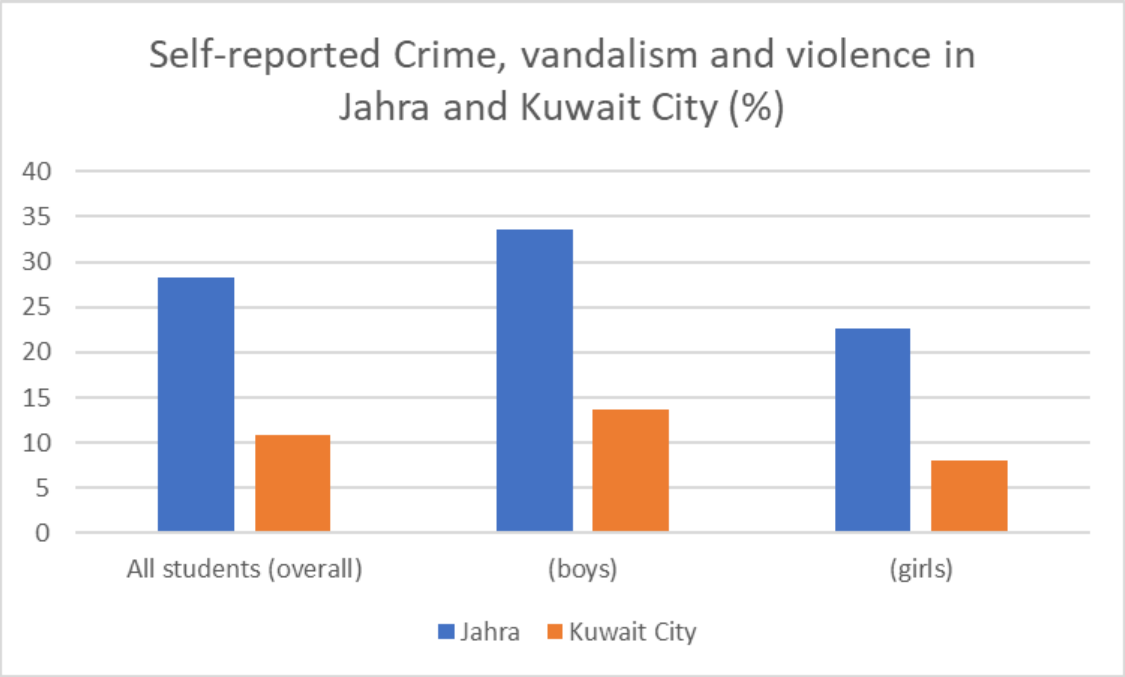

Figure 7.7: Proportions of youths who self-reported crime, vandalism and violence in their living area in Jahra and Kuwait City (expressed as percentages) presented for overall (all students), boys and girls.

Accidents and Injuries: Road Traffic Accidents (RTA)

The proportion of students who were involved in a road traffic accident (RTA) is shown in Table 7.14 for both cities, stratified by gender.

In the past 12 months, a higher proportion of students were involved in a RTA in Jahra (20.7%) compared to Kuwait City (15.4%) (p=0.03). More than half of these RTAs in both cities required doctor, nurse or emergency department intervention, although no significant

difference was observed between urban areas (Kuwait City = 55.8%; Jahra = 50.9%). Conversely, more boys were involved in a RTA requiring medical intervention than girls in both urban areas (Table 7.14).

Accidents and Injuries: School-based and Home/Leisure accidents

The proportion of students who experienced a school-based or home and leisure accident is presented in Table 7.14 for both cities, stratified by gender.

With regards to school-based accidents in the past 12 months, there were no significant differences observed between the cities (Kuwait City = 18.1%; Jahra=17.1%). No statistically significant differences were observed in intercity comparisons between Kuwait City and Jahra. As with RTAs, more boys than girls were involved in school accidents requiring medical intervention in both Jahra and Kuwait City (Table 7.17).

Domestic and/or recreational injuries in the past 12 months (Kuwait City= 41.2%; Jahra= 36.3%) were more widely reported in both cities than school-based accidents with no significant differences between the cities.

As with school-based injuries, the highest proportion of home/leisure accidents that resulted in medical intervention was reported in boys in Jahra (65.7%). When stratifying by gender, a larger proportion of boys in Jahra (65.7%) reported home/leisure accidents that resulted in medical intervention than boys in Kuwait City (51.1%). Interestingly, the opposite was seen in girls, as a larger proportion of girls in Kuwait City (58.5%) experienced home/leisure injuries requiring medical intervention than Jahra (41.5%).

Accidents and Injuries: Sport-related accidents

Whilst a larger proportion of students in Kuwait City (45.7%) compared to Jahra (38.2%) experienced a sport-related accident in the past 12 months, this was not statistically significant.

Boys (Kuwait City= 54.4%; Jahra= 45.3%) appeared to be more likely to report a sport-related accident than girls (Kuwait City= 35.2%; Jahra= 30.4%) in the past 12 months in both cities. No significant differences were observed in terms of sport-related accidents when stratifying by gender between the two cities.

Table 7.14: Young people in Jahra and Kuwait City who experienced a road traffic accident (RTA), school-based and home/leisure accident in the past 12 months and those that required doctor/emergency department intervention due to the accident.

Variable	Jahra		Kuwait City		p-value*
	No.	%	No.	%	
RTA in the past 12 months (% of all young people in urban area)	104	20.7%	77	15.4%	0.03
RTA with injury requiring doctor/emergency department intervention in past 12 months : (% from involved in RTA past 12 months)					
Total:	53	50.9%	43	55.8%	0.43
Boys:	35	13.3%	28	10.9%	0.44
Girls:	18	7.5%	15	6.1%	0.75
Involved in a school accident in the past 12 months (% of all young people in urban area)	88	18.1%	85	17.1%	0.69
School accident requiring doctor/emergency department intervention in past 12 months (% from involved in school accident in past 12 months)					
Total:	46	53.5%	52	61.9%	0.27
Boys:	26	59.1%	34	69.4%	0.30
Girls:	20	47.6%	18	51.4%	0.74
Involved in a home/leisure accident in the past 12 months (% of all young people in urban area)	208	41.2%	187	36.3%	0.11
Home/leisure accident requiring doctor/emergency department intervention in past 12 months (% from involved in home accident in past 12 months)					
Total:	109	53.2%	102	55.1%	0.70
Boys:	65	65.7%	47	51.1%	0.04
Girls:	44	41.5%	62	58.5%	0.01

*Separate results are included for overall (boys and girls), girls, and boys. * P-values calculated using chi-square test..*

Bullying and School Environment

Bullying was assessed through the proportion of students who were victims of bullying and those that took part in bullying others. These findings are presented in Table 7.15, stratified by gender.

The proportion of students who were victims of bullying (at least twice in the past 2 months) was high in both cities, however it was significantly higher in Jahra (27.7%) compared to Kuwait City (20.1%) ($p=0.004$). When stratifying the findings for victims of bullying by gender, it appeared that the significant differences between the two cities were exclusively present in girls. Significantly more girls in Jahra (35.2%) reported that they were victims of bullying than in Kuwait City (15.3%) ($p<0.001$). Also of concern was the higher proportion of girls in Jahra who admitted bullying others (at least twice in the past 2 months) compared to Kuwait City, at 17.1% and 11.1% respectively.

With regards to disliking school, a significantly larger proportion of students in Kuwait City reported disliking their school than in Jahra, at 42.3% and 53.9% respectively ($p<0.001$) (Table 7.15).

Table 7.15: Self-reported bullying (victims and bullying others) and feelings of dislike towards school in young people in Jahra and Kuwait City, stratified by gender.

Variable	Jahra		Kuwait City		Chi-Square	df	p-value *
	No.	%	No.	%			
Being Bullied ** :							
Total:	144	27.7%	106	20.1%	8.27	1	**0.004 ***
Boys:	55	20.6%	66	24.9%	1.40	1	0.24
Girls:	89	35.2%	40	15.3%	27.18	1	**<0.001 ***
Bullied others ϕ :							
Total:	112	21.5%	122	23.1%	0.39	1	0.53
Girls:	43	17.1%	29	11.1%	3.83	1	0.05
Dislike school : (% all students in urban area)	219	42.3%	284	53.9%	12.41	1	**< 0.001 ***
A lot of pressure from school work : (% all students in urban area)	189	36.4%	221	41.9%	3.34	1	0.07

*Separate results are included for overall (boys and girls), girls, and boys. * P-values calculated using chi-square test, p-value statistically significant at p≤0.05/14= 0.004 after adjusting with Bonferroni correction*

*** Being bullied: students that reported being bullied at least twice in the past 2 months. Φ Bullied others: students that reported bullying others at least twice in the past 2 months*

8: Results: Priority Urban Health Indicators for Public Health Policy in Kuwait City and Jahra

This section of the results will focus on the findings in Urban Health Indicators (UHIs) in youths in Jahra and Kuwait City that are relevant to the current Kuwait Public Health policy, namely overweight/obesity - based on International Obesity Task Force (IOTF) and World Health Organisation (WHO) parameters of overweight/obesity (see section 6.6.4), tobacco smoking and cannabis use, and psychological distress.

As previously stated, these three domains were highlighted in the current Kuwait Healthcare Legislative Plan. In line with the objectives of this thesis, this section will focus on i) indicators that are relevant to the current public health in the State of Kuwait and ii) assess how these can represent a potential focus for future public health policy in the country.

8.1 Overweight and Obesity as a Public Health Priority:

8.1.1 Descriptive Presentation of Overweight and Obesity:

BMI was assessed objectively using the measured height (in centimetres) and weight (in kilograms) of students, rather than being based on self-reported measures (as described in Section 6.5.4). Students in Kuwait City tended to be taller than those in Jahra (Table 8.1; Figure 8.1).

Height ranged from 142cm to 195cm (mean =164.3cm) in Kuwait City, and from 140cm to 187cm (mean=161.9cm), in Jahra ($p<0.001$). There appeared to be no significant difference in weight between students from Kuwait City (median = 67kg, IQR= 25) and those in Jahra (median=66.0kg, IQR=27) ($p=0.07$).

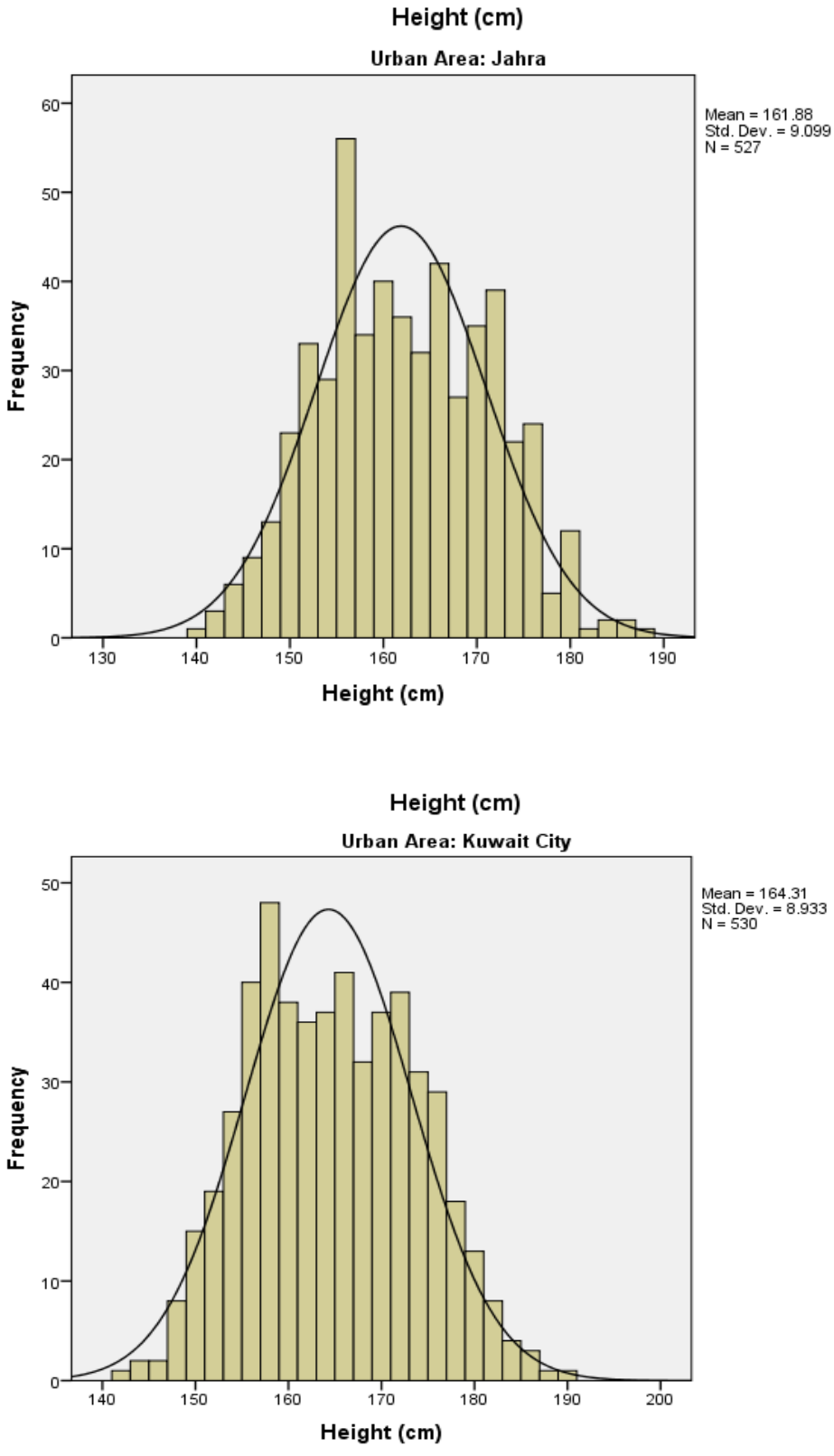

Figure 8.1: Distribution of height (cm) for youths in Jahra (top) and Kuwait City (bottom).

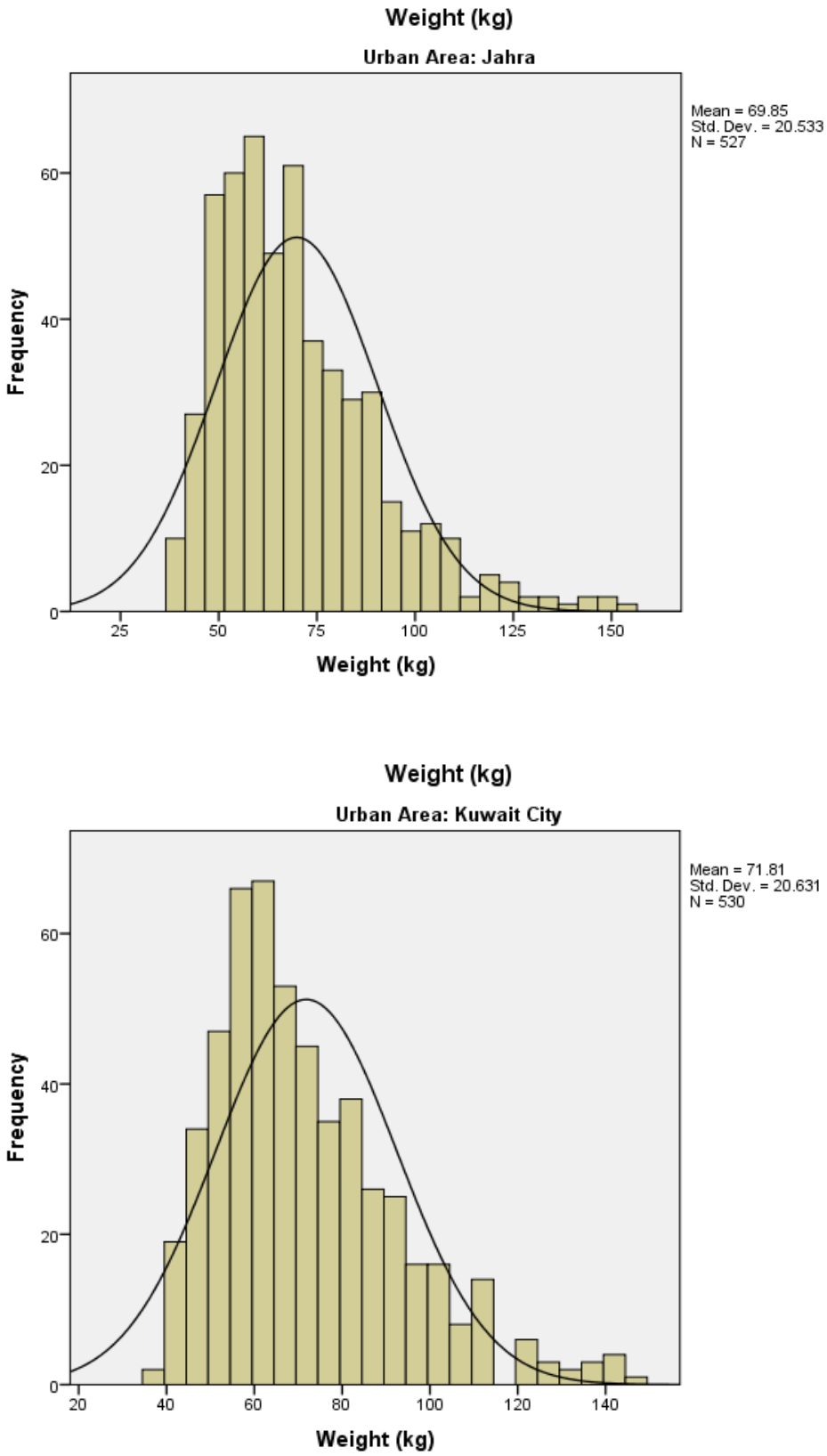

Figure 8.2: Distribution of weight (kg) for youths in Jahra (top) and Kuwait City (bottom).

Table 8.1: Average Height (cm) and Weight (kg) for young people in Jahra and Kuwait City, Kuwait.

Variable	Jahra (n=527)		Kuwait City (n=530)		p-value
	Mean	**sd**	**Mean**	**sd**	
Height (cm)	161.9	9.10	164.3	8.96	<0.001 *
	Median	**IQR**	**Median**	**IQR**	
Weight (kg)	66.0	27	67.0	25	0.07 **

** Student t-test = p-value statistically significant at p<0.05. ** Mann-Whitney U test*

BMI was calculated based on the heights and weights of the students, after adjusting for age using the students' age in months (at the time of the survey) and height in centimetres with the IOTF (International Obesity Task Force) cut-off for overweight, obesity, morbidly obese and thinness (to assess malnutrition) in Kuwait City and Jahra, as described in Chapter 6.6.4 Additionally, BMI was also calculated using WHO (World Health Organisation) parameters (Table 8.2).

The proportions of overweight and obese students using the IOTF cut-offs were extremely high, and appeared similar, in both cities (Table 8.2). In Kuwait City 59.5% of students were classified as overweight or obese compared to 60.4% in Jahra. Of concern were the high proportions of students classified as obese (almost a third of students in both cities; 29.1% in Kuwait City and 28.9% in Jahra).

When stratifying the BMI rates by gender, it appeared that boys (65.4% in Kuwait City and 62.2% in Jahra) were more likely to be overweight and obese than girls (55.4% and 56.5%, respectively).

Looking at morbidly obese students as a relevant category for potential health intervention (IOTF BMI > 35), there were approximately 1 in 8 students from each city classified in this category (12.4% in Kuwait City and 14.7% in Jahra). For girls, there was a difference between Kuwait City (5.8%) and Jahra (12.3%) (p=0.01), although this was not observed for boys.

,

The IOTF category for thinness (measured as BMI < 18.5) was used as an indicator of malnutrition, which was found to be low in both cities (2.9% in Kuwait City and 2.3% in Jahra).

As with the IOTF cut-offs, using the WHO parameters presented similar findings of an extremely high proportion of overweight and obese students in both cities. Based on the WHO cut-offs, the proportion of overweight or obese was 62.0% in Jahra and 64.4% in Kuwait City with no significant differences between the cities. The highest proportion of overweight or obese (WHO guidelines) was observed in boys in Kuwait City followed by boys in Jahra, at 70.3% and 65.2% respectively.

Table 8.2: Estimated BMI from measured height and weight for students in Jahra and Kuwait City

Variable	Jahra		Kuwait City		Chi-Square value	df	p-value *
	No.	%	No.	%			
IOTF BMI (Overweight)							
Total:	160	30.6%	164	31.4%	0.07	1	0.79
Boys:	79	29.3%	83	31.6%	0.33	1	0.56
Girls:	81	32.0%	81	31.2%	0.04	1	0.83
IOTF BMI (Obese)							
Total:	151	28.9%	152	29.1%	0.01	1	0.95
Boys:	89	33.0%	89	33.8%	0.05	1	0.83
Girls:	62	24.5%	63	24.2%	0.01	1	0.94
IOTF BMI (Overweight and Obese)							
Total:	311	59.5%	316	60.4%	0.10	1	0.75
Boys:	168	62.2%	172	65.4%	0.58	1	0.45
Girls:	143	56.5%	144	55.4%	0.07	1	0.80
IOTF BMI (Morbidly Obese)							
Total:	77	14.7%	65	12.4%	1.17	1	0.28
Boys:	46	17.0%	50	19.0%	0.35	1	0.55
Girls:	31	12.3%	15	5.8%	6.60	1	0.01
IOTF BMI (Thinness) (% of all students in urban area)	12	2.3%	15	2.9%	0.34	1	0.55
WHO BMI (Overweight and Obese)							
Total:	324	62.0%	337	64.4%	0.70	1	0.41
Boys:	176	65.2%	185	70.3%	1.62	1	0.20
Girls:	253	49.3%	260	50.7%	0.01	1	0.99

*. * P-values calculated using chi-square test. p-value statistically significant at p≤0.05/10= 0.005 after adjusting with Bonferroni correction.*

To understand some of the context behind the urban health indicators of overweight and obesity, students were asked about body perception and whether they followed a diet (Table 8.3).

Students in Jahra were significantly more likely to perceive their body weight as "normal" than in Kuwait City, at 38.7% and 29.9% respectively (p=0.003). Boys in both cities were more likely to perceive their weight as normal and not follow a diet than girls (Table 8.3).

Conversely, significantly more young people in Kuwait City reported following a diet (to lose or gain weight) than in Jahra, at 19.8% and 12.0% respectively (p=0.001). However, when stratifying by gender, this significant difference was only observed in girls between the two cities, with only 1 in 10 boys in both cities reported following a diet (Table 8.3). Interestingly, girls were approximately three times more likely to follow a diet than boys in Kuwait City.

Table 8.3: Students following a diet and self-perceived weight in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square Value	df	p-value *
	No.	**%**	**No.**	**%**			
Following a diet (to gain or lose weight):							
Total:	63	12.0%	104	19.8%	11.97	1	**0.001 ****
Boys:	26	9.6%	28	10.6%	0.14	1	0.71
Girls:	37	14.5%	76	29.1%	16.10	1	**<0.001****
Perceive weight as normal and not following a diet:							
Total:	203	38.7%	157	29.9%	8.94	1	**0.003 ****
Boys:	116	43.0%	95	36.0%	2.72	1	0.10
Girls:	87	34.1%	62	23.8%	6.74	1	0.009

** P-values calculated using chi-square test. p-value statistically significant at p≤0.05/10= 0.005 after adjusting with Bonferroni correction.*

In both cities, it appeared that overweight and obese students were significantly more likely to perceive their weight as not “normal” than those with a normal BMI (p<0.001) (Table 8.4). However, overweight and obese students in Kuwait City appeared to be more aware of their body weight than those in Jahra. Approximately 1 in 4 of overweight and obese students in Jahra perceived their weight as “normal” compared to 1 in 8 in Kuwait City. Additionally, a higher proportion of overweight and obese students in Kuwait City (27.5%) followed a diet than in Jahra (18.4%).

Table 8.4: Overweight and obese students body perception and use of diets in Jahra and Kuwait City.

Variable	Overweight/ obese BMI		Normal BMI		Chi-Square Value	df	p-value *
	No.	%	No.	%			
Jahra							
Following a diet -to gain or lose weight (% all students in urban area)	57	18.4%	6	2.8%	28.53	1	**0.001 ****
Perceive weight as normal and not following a diet (% all students in urban area)	79	25.5%	121	57.3%	53.88	1	**0.001 ****
Kuwait City							
Following a diet -to gain or lose weight (% all students in urban area)	86	27.5%	17	8.3%	28.62	1	**0.001****
Perceive weight as normal and not following a diet (% all students in urban area)	44	14.1%	111	54.1%	94.94	1	**< 0.001 ****

** P-values calculated using chi-square test. p-value statistically significant at p≤0.05/10= 0.005 after adjusting with Bonferroni correction.*

8.1.2 Factors associated with the occurrence of obesity in Kuwait City and Jahra

Univariate logistic regression for obesity (as a dependent variable):

The univariate associations between pre-selected UHIs in demographic, health status, lifestyle and environmental factors (as predictor variables) with obesity (dependent dichotomous variable) were analysed descriptively using univariate binary logistic regression for Jahra and Kuwait City, and are summarised in Table 8.5.

Independent variables in the univariate analysis for obesity (dependent variable) were pre-selected as described in Chapter 6.7.2 and are listed in Appendix F. As previously stated in Chapter 6.7.2, independent variables that were associated with obesity in the univariate analysis at $p \leq 0.1$ were included in the multi-variate logistic regression model. SES was included in the multi-variate model for obesity due to its importance as a potential confounder.

In the univariate analysis (Table 8.5), significant associations with obesity were observed in terms of gender and following a diet in both cities. While in Kuwait City, obesity was significantly associated with physical activity, and self-perceived health.

Interestingly, dietary urban health indicators (such as fruit/vegetable, diary produce and fizzy drinks consumption) were not significantly associated with obesity. Also, psychological distress and psychosomatic symptoms were not significantly associated with obesity. Other prominent urban health indicators observed in this study in both cities, such as low back pain and victims of bullying, were also not associated with obesity.

Table 8.5: Univariate logistic regression : Association of urban health indicators (UHI) with obesity in Jahra and Kuwait City

Variables	Jahra			Kuwait City		
	No.	**% ***	**p-value #**	**No**	**% ***	**p-value#**
Demographic Indicators						
Gender:						
Girls	62	24.5%		63	24.2%	
Boys	89	33.0%	***0.03****	89	33.8%	***0.02****
	Mean	**SD**	**p-value ϕ**	**Mean**	**SD**	**p-value ϕ**
SES (continuous variable – FAS score)	5.38	1.44	0.17	5.85	1.14	0.76
Health Outcomes/Status						
Following a diet:						
No	116	25.3%		99	23.9%	
Yes	35	55.6%	***<0.001****	50	48.5%	***<0.001****
Good self-perceived health						
No	20	28.6%		24	47.1%	
Yes	128	28.5%	0.99	126	26.9%	***0.003****
Psychological Distress						
Normal	111	27.3%		133	29.3%	
Abnormal	39	35.1%	0.14	17	25.4%	0.50
Psychosomatic symptoms :						
No	115	27.8%		135	29.4%	
Yes	35	33.0%	0.30	17	26.6%	0.64
Low Back Pain:						
No	43	33.1%		64	33.5%	
Yes	108	27.6%	0.23	88	26.8%	0.15
Lifestyle Factors						
Physical activity ≥ 2hrs/week:						
No	105	30.1%		125	32.4%	
Yes	44	26.7%	0.43	26	19.8%	***0.007****
Regular salad/vegetables consumption:						
No	75	28.0%		84	27.6%	
Yes	74	29.2%	0.75	67	30.7%	0.44
Regular fruit consumption:						
No	95	26.2%		105	30.4%	
Yes	53	34.2%	0.14	46	26.3%	0.33
Regular Diary produce consumption						
No	55	29.1%		51	29.3%	
Yes	90	27.8%	0.75	100	29.2%	0.97
Regular fizzy/low calorie drinks						
No	49	26.1%		85	27.5%	
Yes	98	30.3%	0.30	65	31.4%	0.34

Contd…	No.	% *	p-value #	No.	% *	p-value#
Physical activity ≥ 60 mins per day:						
No	139	29.4%		146	30.3%	
Yes	12	25.5%	0.58	6	10.3%	***0.01***
Ever Smoked						
No	96	27.2%		101	27.2%	
Yes	54	32.5%	0.21	50	33.6%	0.15
Frequently watching television						
No	61	28.2%		71	27.5%	
Yes	86	29.2%	0.82	77	30.4%	0.47
Environment						
Being Bullied ≤twice/past 2 months :						
No	114	30.5%		114	27.5%	
Yes	36	25.4%	0.25	36	34.3%	0.17

*# P-values calculated using chi-square test. * Percentages (and numbers) represent young people who were obese from the total sample that answered each choice for every UHI ** P-value = 0.1 included in the univariate analysis. Φ P-Value measured by t-test.*

Multiple logistic regression for obesity (as a dependent variable):

To summarise the relationship between predictor UHI variables with obesity, multiple logistic regression was used to provide effect estimates (adjusted Odds Ratios – OR), these are provided in Table 8.6. The predictor (independent) variables included in the multi-variate model for obesity are listed in Appendix G.

As observed in the univariate analysis, gender was significantly associated with obesity in both cities. Boys were significantly more likely to be obese than girls in both cities, even after fully adjusting for all indicators in the multivariable analysis (OR=1.72; 95% CI = 1.14-2.59 in Jahra and OR= 3.02, 95% CI=1.89-4.85 in Kuwait City).

Following a specific diet was also independently associated with obesity in both cities, students that followed a diet were 0.24 and 0.22 times less likely to be obese, in Jahra (95% CI=0.14-0.41) and Kuwait City (95% CI= 0.21-0.75) respectively.

In Kuwait City, students that engaged in vigorous physical activity (≥ 2 hours per week) were significantly less likely to be obese, and this was observed after adjusting for all indicators in the multivariable analysis (OR= 0.41, 95% CI = 0.24-0.73). Engagement in daily physical activity in Kuwait City was also independently associated with reducing the likelihood of obesity. Students in Kuwait City that engaged in daily physical activity (≥ 60 minutes per day)

were less likely to be obese (OR = 0.34, 95% CI = 0.11-0.98), although this was not significant.

8.1.3 Estimating the Burden of Obesity: associations with health outcomes

To investigate how the experience of obesity might influence physical and mental health, multiple logistic regression was used to investigate the association of obesity (dependent variable) with self-reported perceived health using the same multiple logistic regression model (Table 8.6). Students who were obese were significantly less likely to perceive their health as (very) good and excellent in Kuwait City, and this was after adjusting for all indicators in the multivariable analysis (OR=0.40, 95% CI= 0.21-0.76).
Whilst good self-reported health was significantly negatively associated with obesity in Kuwait City, it was not significant in students in Jahra.

Table 8.6: Association between demographic, health status and lifestyle factors with obesity (defined as BMI ≥ 30 using IOTF cut-offs for young people)

Variables	Jahra					Kuwait City				
	No.	**%**	**OR**	**95% CI**	**p-value***	**No.**	**%**	**OR**	**95% CI**	**p-value***
Gender:										
Girls	62	24.5%	1.00			63	24.2%	1.00		
Boys	89	33.0%	1.52	1.03-2.22	0.03	89	33.8%	1.60	1.09-2.34	0.02
Multivariate Adjustment[$]			*1.72*	*1.14-2.59*	*0.009*			*3.02*	*1.89-4.85*	*< 0.001*
Good self-perceived health:										
No	20	28.6%	1.00			24	47.1%	1.00		
Yes	128	28.5%	0.99	0.57-1.74	0.99	126	26.9%	0.41	0.23-0.74	0.003
Multivariate Adjustment[$]								*0.40*	*0.21-0.75*	*0.004*
Following a diet:										
No	116	25.3%	1.00			99	23.9%	1.00		
Yes	35	55.6%	0.27	0.16-0.47	<0.001	50	48.5%	0.33	0.21-0.52	<0.001
Multivariate Adjustment[$]			*0.24*	*0.14-0.41*	*<0.001*			*0.22*	*0.13-0.37*	*<0.001*
Physical activity ≥ 2hrs per week:										
No	105	30.1%	1.00			125	32.4%	1.00		
Yes	44	26.7%	0.85	0.56-1.28	0.43	26	19.8%	0.52	0.32-0.84	0.007
Multivariate Adjustment[$]								*0.41*	*0.24-0.73*	*0.002*
Physical activity ≥ 60 mins per day:										
No	139	29.4%	1.00			146	30.3%	1.00		
Yes	12	25.5%	0.82	0.42-1.63	0.58	6	10.3%	0.26	0.09-0.75	0.01
Multivariate Adjustment[$]								*0.34*	*0.11-0.98*	*0.06*
	Mean	**SD**	**OR**	**95% CI**	**p-value ****	**Mean**	**SD**	**OR**	**95% CI**	**p-value ****
SES (continuous variable – FAS score)	5.38	1.44	0.91	0.80-1.03	0.17	5.85	1.14	0.98	0.83-1.15	0.76
Multivariate Adjustment				0.80-1.05	0.19			0.99	0.82-1.19	0.90

No = number of young people with obesity (defined as BMI ≥ 30 using IOTF cut-offs for young people)

% = proportion of young people with obesity (defined as BMI ≥ 30 using IOTF cut-offs for young people)

OR = Odds Ratio

95% CI = 95% Confidence Interval

* = chi-squared test = p-value statistically significant at p≤0.05 ** t-test = p-value statistically significant at p≤0.05

[$] Multivariate logistic regression adjustment performed for variables with p≤0.1 in the univariate analysis for both cities.

8.2 Tobacco Smoking and Cannabis Use as a Public Health Priority:

This section will analyse urban health indicators in tobacco smoking and cannabis use, which were identified as public health priorities in youth in the current healthcare policy. A descriptive intercity presentation of tobacco smoking and cannabis use will be followed by the factors associated with tobacco smoking and cannabis use in Jahra and Kuwait City.

8.2.1 Descriptive Presentation of Tobacco Smoking and Cannabis Use in Jahra and Kuwait City:

The findings for students that have reported 'ever smoking' tobacco are presented in Table 8.7. The pattern of 'ever smoking' tobacco appeared similar in both cities and there was no significant difference in the proportion of students that have smoked tobacco in the past. 31.9% and 28.4% of students have reported smoking tobacco in the past, in Jahra and Kuwait City respectively.

There appeared to be a clear gender difference in terms of tobacco smoking, with the issue being predominantly self-reported by boys in both cities. In both cities, a higher proportion of boys reported smoking tobacco in the past compared to girls. Approximately 1 in 2 boys in Jahra and Kuwait City have reported smoking tobacco in the past compared to approximately 1 in 10 girls in both cities. Additionally, daily smoking was also more pronounced in boys than in girls in both cities. 18.6% and 16.9% of boys smoked tobacco daily, in Jahra and Kuwait City respectively, compared to only 0.8% in girls in both cities. Overall, approximately 1 in 7 students in both cities smoked at least weekly.

With regards to the age of onset of smoking, 15.4% and 13.7% of students reported first smoking ≤ the age of 13, in Jahra and Kuwait City accordingly.

The findings for cannabis use in the past are presented in Table 8.7, which was only self-reported by a small proportion of students in Jahra (2.5%) and Kuwait City (3.1%). As with

smoking tobacco, cannabis use was self-reported higher in boys compared to girls in both cities. 4.1% and 5.3% of boys reported cannabis use in Jahra and Kuwait City accordingly.

Table 8.7: Tobacco smoking and cannabis use in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square Value	df	p-value *
	No.	%	No.	%			
Ever Smoked Tobacco							
Total:	167	31.9%	150	28.4%	1.55	1	0.21
Boys:	137	50.9%	128	48.1%	0.42	1	0.52
Girls:	30	11.8%	22	8.4%	1.66	1	0.19
Smoked at least weekly							
(% all students in urban area)	68	13.5%	74	14.7%	0.26	1	0.61
First smoking ≤ 13 years							
(% all students in urban area)	76	15.4%	69	13.7%	0.56	1	0.46
Daily Smoking							
Total:	51	10.2%	46	9.1%	0.32	1	0.58
Boys:	49	18.6%	44	16.9%	0.28	1	0.60
Ever Used Cannabis							
Total:	13	2.5%	16	3.1%	0.28	1	0.60
Boys:	11	4.1%	14	5.3%	0.44	1	0.51

** P-values calculated using chi-square test.*

8.2.2 Factors associated with the occurrence of smoking in Jahra and Kuwait City:

As previously stated, addressing youth tobacco smoking was chosen as part of the central health policy for the Government of Kuwait, hence the urban health indicator for 'ever smoking tobacco' in the past was investigated further in both cities.

Univariate logistic regression for "ever smoking tobacco" (as a dependent variable):

The univariate associations between pre-selected UHIs in demographic, health status, lifestyle and environmental factors (as predictor variables) with ever smoking tobacco (dependent dichotomous variable) were analysed descriptively using univariate binary logistic regression for Jahra and Kuwait City, and are summarised in Table 8.8

Independent variables in the univariate analysis for "ever smoking tobacco" (dependent variable) were pre-selected as described in Chapter 6.7.2 and are listed in Appendix F. As previously stated in Chapter 6.7.2, independent variables that were associated with "ever smoking tobacco" in the univariate analysis at $p \leq 0.1$ were included in the multi-variate logistic regression model. As previously stated in Chapter 6.7.2, SES could be considered a potential confounder when analysing "ever smoking tobacco", and therefore it was included in the multi-variate model even if $p > 0.1$.

In the univariate analysis, significant associations with smoking (evaluated by self-reported "ever smoking tobacco") were observed in terms of gender and living in an area with crime, violence and vandalism in both cities. In Jahra, socio-economic status (measured by Family Affluence Scale score) and psychological distress (measured by SDQ score) were significantly associated with smoking.

There appears to be no association between any of the lifestyle factors examined and smoking in both cities. With the exception of psychological distress in Jahra, none of the other examined health outcome indicators were significantly associated with smoking in both cities.

Table 8.8: Univariate logistic regression : Association of urban health indicators (UHI) with ever smoking tobacco in Jahra and Kuwait City.

Variables	Jahra			Kuwait City		
	No.	**% ***	**p-value#**	**No**	**% ***	**p-value#**
Demographic Indicators						
Gender:						
Girls	30	11.8%		22	8.4%	
Boys	137	50.9%	**<0.001****	128	48.1%	**<0.001****
	Mean	SD	**p-valueϕ**	Mean	**SD**	**p-valueϕ**
SES (continuous variable – FAS score)	5.38	1.44	**0.001****	5.85	1.14	0.58
Health Outcomes/Status						
Good self-perceived health						
No	18	25.7%		18	35.3%	
Yes	149	33.2%	0.22	130	27.4%	0.24
	Mean	SD	**p-valueϕ**	Mean	SD	**p-valueϕ**
Psychological Distress:						
(continuous variable - SDQ score)	15.39	5.28	**0.02****	13.70	4.96	0.69
Psychosomatic symptoms :						
No	133	32.3%		131	28.4%	
Yes	34	31.8%	0.92	19	29.2%	0.88
Low Back Pain:						
No	44	33.6%		47	24.6%	
Yes	123	31.5%	0.65	103	30.9%	0.13
Lifestyle Factors						
Overweight/Obese (BMI ≥ 25) :						
No	63	30.1%		55	26.6%	
Yes	103	33.2%	0.46	94	29.9%	0.41
Obese (BMI ≥ 30 in IOTF cut-off):						
No	112	30.4%		99	26.8%	
Yes	54	36.0%	0.21	50	33.1%	0.15
Physical activity ≥ 60 mins per day:						
No	154	32.4%		136	28.0%	
Yes	11	24.4%	0.27	13	31.7%	0.18
Environment						
Being Bullied ≤twice/past 2 months :						
No	126	33.7%		118	28.1%	
Yes	38	26.8%	0.14	32	30.2%	0.17
Crime/Violent Area:						
No	97	26.1%		124	26.4%	
Yes	67	46.5%	**< 0.001****	25	43.9%	**0.007****

*# P-values calculated using chi-square test. *Percentages (and numbers) represent young people who were obese from the total sample that answered each choice for every UHI ** P-value = 0.1 included in the univariate analysis. Φ P-Value measured by t-test.*

Multiple logistic regression for ever smoking tobacco (dependent variable):

To summarise the relationship between the urban health indicators that were significantly associated with 'ever' smoking tobacco, multiple logistic regression analysis was used to provide effect estimates (adjusted Odds Ratio – OR), these are presented in Table 8.9. The predictor (independent) variables included in the multi-variate model for "ever smoking tobacco" are listed in Appendix G.

After fully adjusting for all urban health indicators in the multivariable analysis, gender was still significantly associated with (ever) smoking tobacco in both cities. Boys were significantly more likely to have tried smoking tobacco compared to girls, with boys being 11.05 and 9.62 times more likely than girls to have ever smoked tobacco in Jahra (95% CI= 6.61-18.47) and Kuwait City (95% CI= 5.82-15.89) respectively.

In both cities, living in an area with crime, violence and vandalism was independently associated with increasing the likelihood of (ever) smoking tobacco. In both cities, students that self-reported living in an area with crime, violence and vandalism were approximately 90% more likely to have ever smoked tobacco (Jahra 95% CI=1.19-3.07, Kuwait City 95% CI=1.02-3.61).

Psychological distress continued to be significantly associated with (ever) smoking in Jahra, even after adjusting for other indicators in the multivariable analysis, as an increase in one unit of the SDQ score (measuring an elevated risk of psychological distress) increased the risk of ever smoking tobacco by 9% (95% CI=1.05-1.14).

Table 8.9: Association between demographic and lifestyle factors with ever smoking tobacco in the past (dependent variable yes/no).

Variables	Jahra					Kuwait City				
	No.	**%**	**OR**	**95% CI**	**p-value***	**No.**	**%**	**OR**	**95% CI**	**p-value***
Gender:										
Girls	30	11.8%	1.00			22	8.4%	1.00		
Boys	137	50.9%	7.75	4.94-12.15	< 0.001	128	48.1%	10.11	6.14-16.66	< 0.001
Multivariate Adjustment[$]			11.05	6.61-18.47	< 0.001			9.62	5.82-15.89	< 0.001
Crime/Violent Area:										
No	97	26.1%	1.00			124	26.4%	1.00		
Yes	67	46.5%	2.47	1.65-3.68	< 0.001	25	43.9%	2.17	1.23-3.81	0.007
Multivariate Adjustment[$]			1.91	1.19-3.07	0.007			1.91	1.02-3.61	0.04
	Mean	**SD**	**OR**	**95% CI**	**p-value ****	**Mean**	**SD**	**OR**	**95% CI**	**p-value ****
Psychological Distress: (continuous variable - SDQ score)	15.39	5.28	1.05	1.01-1.08	0.02	13.70	4.96	1.01	0.97-1.05	0.69
Multivariate Adjustment[$]			1.09	1.05-1.14	< 0.001					
SES (continuous variable – FAS score)	5.38	1.44	0.81	0.71-0.92	0.001	5.85	1.14	0.96	0.81-1.13	0.58
Multivariate Adjustment			0.88	0.76-1.03	0.11			1.03	0.86-1.24	0.73

No = number of students that reported ever smoking tobacco in the past

% = proportion of students of students that reported ever smoking tobacco in the past

OR = Odds Ratio

SD= Standard deviation

95% CI = 95% Confidence Interval

* = chi-squared test = p-value statistically significant at p≤0.05

** = t-test = p-value statistically significant at p≤0.05

[$] Multivariate logistic regression adjustment performed for variables with p≤0.1 in the univariate analysis for both cities.

8.3 Psychological Distress as a Public Health Priority:

This section will analyse the findings in Jahra and Kuwait City in youth in terms of an elevated risk of psychological distress, an issue identified as a core focus in the current public health policy of the country. A descriptive inter-city presentation of an elevated risk of psychological distress (denoted by SDQ ≥ 20) will be followed by an analysis of the factors associated with psychological distress in Jahra and Kuwait City. Additionally, due to the high prevalence of self-reported low back pain in both cities, and its known relevance to psychological and mental health, this indicator will be analysed further in terms of its association with other urban health indicators.

8.3.1 Descriptive Presentation of Psychological Distress in Jahra and Kuwait City:

Psychological distress was assessed by self-reported abnormal SDQ score (of ≥20), indicating an elevated risk of psychological problems. The findings for this indicator as well as an abnormal pro-social score are summarised in Table 8.10 for both cities.

Psychological distress appeared to be more of an issue in Jahra than in Kuwait City. A significantly larger proportion of students self-reported an elevated risk score for psychological problems in Jahra (21.5%) compared to Kuwait City (12.7%) ($p<0.001$).

When stratifying abnormal SDQ scores (of ≥20) by gender, it appeared that significantly more girls in Jahra (1 in 4 girls) reported an elevated risk of psychological problems compared to Kuwait City (1 in 7 girls) ($p<0.001$). On the other hand, there were no significant differences in self-reported psychological distress in boys in Jahra and Kuwait City.

With regards to pro-social factors, only 3.1% and 3.6% of students reported an abnormal SDQ pro-social score (between 0-4), in Jahra and Kuwait City respectively (Table 8.10).

Table 8.10: Elevated risk of psychological problems (SDQ score ≥ 20) and abnormal pro-social score in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square Value	df	p-value *
	No.	%	No.	%			
Elevated risk of psychological problems **							
Total:	112	21.5%	67	12.7%	14.27	1	< 0.001 *
Boys:	43	16.2%	29	11.0%	3.09	1	0.07
Girls:	69	27.0%	38	14.4%	12.39	1	< 0.001 *
Abnormal pro-social score ϕ							
(% all students in urban area)	16	3.1%	22	3.6%	0.26	1	0.34

** P-values calculated using chi-square test, p-value statistically significant at p≤0.05/5= 0.01 after adjusting with Bonferroni correction.** Elevated Risk of Psychological Problems was measured by an abnormal SDQ (overall Strength and Difficulties Questionnaire) score of ≥ 20. Φ Pro-social score was considered abnormal if scored 0-4 on the SDQ Strengths section.*

8.3.2 Factors associated with psychological distress in Jahra and Kuwait City:

As understanding the current situation with regards to the prevalence of psychological distress in youths was one of the primary focuses of the current Kuwait Healthcare Plan, this urban health indicator (UHI) was investigated further to determine its association with demographic, health status, lifestyle and environmental factors in both cities.

Univariate logistic regression for psychological distress – denoted by an SDQ score of ≥ 20 (as a dependent variable):

The univariate associations between pre-selected UHIs in demographic, health status, lifestyle and environmental factors (as predictor variables) with psychological distress

(dependent dichotomous variable) were analysed descriptively using univariate binary logistic regression for Jahra and Kuwait City, and are summarised in Table 8.11.

Independent variables in the univariate analysis of elevated risk of psychological distress (dependent variable) were pre-selected as described in Chapter 6.7.2 and are listed in Appendix F. As previously stated in Chapter 6.7.2, independent variables that were associated with psychological distress in the univariate analysis at $p \leq 0.1$ were included in the multi-variate logistic regression model. SES was included in the multi-variate model for psychological distress due to its importance as a potential confounder.

In the univariate analysis, significant associations with psychological distress were observed in terms of gender in Jahra but not in Kuwait City. Also in Jahra, socioeconomic status was significantly associated with psychological distress.

With the exception of physical activity in Jahra, none of the other lifestyle factors and health outcome indicators were significantly associated with psychological distress in both cities. Interestingly, obesity and smoking tobacco were not significantly associated with psychological distress in either city.

Several important associations were observed between environmental indicators and psychological distress, one of which was bullying, which was significantly associated with psychological distress in both cities. Self-reported environmental factors in Jahra, such as crime and violence and exposure to severe noise, were significantly associated with psychological distress.

Table 8.11: Univariate Logistic Regression: Association of urban health indicators (UHI) with psychological distress (denoted by SDQ score ≥ 20) in Jahra and Kuwait City

Variables	Jahra			Kuwait City		
	No.	**% ***	**p-value#**	**No**	**% ***	**p-value#**
Demographic Indicators						
Gender:						
Girls	43	16.2%		29	11.0%	
Boys	69	27.0%	**0.003****	38	14.4%	0.24
	Mean	SD	**p-valueϕ**	Mean	SD	**p-valueϕ**
SES (continuous variable – FAS score)	5.38	1.44	**0.08 ****	5.85	1.14	0.38
Health Outcomes/Status						
Good self-perceived health						
No	19	26.8%		10	19.6%	
Yes	86	20.8%	0.16	56	11.8%	0.13
Lifestyle Factors						
Obese (BMI ≥ 30 in IOTF cut-off):						
No	72	19.6%		50	13.5%	
Yes	39	26.0%	0.12	17	11.3%	0.51
Ever Smoked Tobacco						
No	71	20.3%		46	12.2%	
Yes	41	24.6%	0.27	21	14.1%	0.56
Physical activity *≥ 2hrs per week:*						
No	85	24.2%		52	13.4%	
Yes	26	16.0%	**0.04****	15	11.5%	0.57
Frequently watching television						
No	45	21.1%		32	12.4%	
Yes	67	22.6%	0.70	34	13.2%	0.77
Environmental factors						
Being Bullied ≥twice/past 2 months :						
No	61	16.4%		11.1%	1.00	
Yes	50	35.5%	**<0.001****	19.0%	1.87	**0.03****
Involved in a traffic accident:						
No	15	28.8%		7	20.5%	
Yes	16	30.2%	0.88	8	18.6%	0.44
Exposure to severe noise:						
No	88	19.6%		58	12.1%	
Yes	23	34.8%	**0.006****	9	20.5%	0.12
Crime/Violent Area:						
No	66	17.8%		12.2%	1.00	
Yes	44	30.6%	**0.002 ****	17.5%	1.53	0.26

*# P-values calculated using chi-square test. * Percentages (and numbers) represent young people who were obese from the total sample that answered each choice for every UHI ** P-value = 0.1 included in the univariate analysis. Φ P-Value measured by t-test.*

Multiple logistic regression for psychological distress (dependent variable):

To summarise the relationship between the urban health indicators that were significantly associated with psychological distress, multiple logistic regression was performed to provide effect estimates (as adjusted Odds Ratios) as shown in Table 8.12. The predictor (independent) variables included in the multi-variate logistic regression model for psychological distress are listed in Appendix G.

In the multivariate analysis, gender was significantly associated with psychological distress in Jahra, even after fully adjusting for all urban health indicators in the multivariable analysis. Girls were 66% more likely than boys to be at an elevated risk of psychological distress in Jahra (OR=1.66; 95% CI= 1.02-2.71).

Bullying continued to be an important issue and was independently associated with psychological distress in both cities after multivariable analysis adjustment. Students that were victims of bullying (at least twice in the past two months) were more likely to report an elevated risk of psychological distress (OR=2.30; 95% CI=1.43-3.70 in Jahra and OR=1.86 95%, CI 1.04-3.33 in Kuwait City).

In Jahra, other environmental indicators, such as living in area with crime and violence and exposure to severe noise continued to be significantly associated with psychological distress even after adjusting for other indicators in the multivariable analysis. Students in Jahra that reported living in an area with crime and violence more likely to be psychologically distress (OR=1.95; 95% CI=1.20-3.16). Similarly, students in Jahra that were exposed to severe noise were 92% more likely to have an elevated risk of psychological distress (OR=1.92; 95% CI=1.06-3.50).

After adjusting for other indicators in the multivariable analysis, vigorous physical activity was not found to be significantly associated with psychological distress in Jahra (Table 8.12).

Table 8.12: Association between demographic and lifestyle factors with elevated risk of psychological distress (denoted by SDQ score ≥ 20).

Variables	Jahra					Kuwait City				
	No.	**%**	**OR**	**95% CI**	**p-value***	**No.**	**%**	**OR**	**95% CI**	**p-value***
Gender:										
Boys	43	16.2%	1.00			29	11.0%	1.00		
Girls	69	27.0%	1.91	1.24-2.92	0.003	38	14.4%	1.37	0.82-2.29	0.24
Multivariate Adjustment[$]			1.66	1.02-2.71	0.04					
Physical activity ≥ 2hrs per week:										
No	85	24.2%	1.00			52	13.4%	1.00		
Yes	26	16.0%	0.59	0.37-0.96	0.04	15	11.5%	0.84	0.45-1.55	0.57
Multivariate Adjustment[$]			0.69	0.41-1.18	0.18					
Crime/Violent Area :										
No	66	17.8%	1.00			57	12.2%	1.00		
Yes	44	30.6%	2.03	1.31-3.17	0.002	10	17.5%	1.53	0.73-3.21	0.26
Multivariate Adjustment[$]			1.95	1.20-3.16	0.007					
Exposure to severe noise :										
No	88	19.6%	1.00			58	12.1%	1.00		
Yes	23	34.8%	2.19	1.26-3.83	0.006	9	20.5%	1.87	0.86-4.09	0.12
Multivariate Adjustment[$]			1.92	1.06-3.50	0.03					
Being Bullied ≥ twice/2 months :										
No	61	16.4%	1.00			47	11.1%	1.00		
Yes	50	35.5%	2.81	1.81-4.37	< 0.001	20	19.0%	1.87	1.05-3.32	0.03
Multivariate Adjustment[$]			2.30	1.43-3.70	< 0.001			1.86	1.04-3.33	0.03
	Mean	**SD**	**OR**	**95% CI**	**p-value ****	**Mean**	**SD**	**OR**	**95% CI**	**p-value ****
SES (continuous variable – FAS score)	5.38	1.44	0.88	0.76-1.02	0.08	5.85	1.14	0.91	0.73-1.12	0.38
Multivariate Adjustment			0.89	0.76-1.04	0.15			0.92	0.74-1.15	0.48

No = number of students with an elevated risk of psychological distress (denoted by SDQ score of ≥20)

% = proportion of students with an elevated risk of psychological distress (denoted by SDQ score of ≥20)

OR = Odds Ratio SD= Standard Deviation

* = chi squared test = p-value statistically significant at p≤0.05 ** = t test = p value statistically significant at p≤0.05

[$] Multivariate logistic regression adjustment performed for variables with p≤0.1 in the univariate analysis for both cities

8.3.3 Descriptive Presentation of low back pain in Jahra and Kuwait City:

Due to the extremely high proportion of youths in both cities that reported suffering from low back pain in the past month and its possible association with psychological and mental health, this indicator was investigated in more detail. As previous stated, mental and psychological health in young people was highlighted as a key focus of the current healthcare policy in Kuwait and the extremely high proportion of self-reported low back pain in this study provide the rationale for this approach.

The proportion of students who reported low back pain (in the past month) is shown in Table 8.13 for both cities, stratified by gender.

Whilst low back pain was widely reported in both cities, it was significantly more pronounced in Jahra (74.9%) compared to Kuwait City (63.5%) ($p<0.001$). However, when stratifying by gender, this significant difference was exclusively present in girls (Kuwait City= 64.3%; Jahra= 82.4%; $p<0.001$). There appeared to be a considerably higher proportion of girls (82.4%) who reported low back pain compared to boys (67.9%) in Jahra, although this was not observed in Kuwait City (boys= 62.7%; girls= 64.3%).

Table 8.13: Self-reported low back pain (in the past month) in Jahra and Kuwait City.

Variable	Jahra		Kuwait City		Chi-Square Value	df	p-value**
	No.	%	No.	%			
Low Back Pain – in the past month:							
Total:	394	74.9%	334	63.5%	16.06	1	**< 0.001 ***
Boys:	184	67.9%	165	62.7%	1.57	1	0.21
Girls:	210	82.4%	169	64.3%	21.59	1	**<0.001***

*Separate results are included for overall (boys and girls), girls, and boys. p-value statistically significant at p≤0.05/10= 0.05 after adjusting with Bonferroni correction. ** P-values calculated using chi-square test.*

8.3.4 Factors associated with low back pain in Jahra and Kuwait City:

Univariate logistic regression for Low Back Pain (as a dependent variable):

The univariate associations between pre-selected UHIs in demographic, health status, lifestyle and environmental factors (as predictor variables) with low back pain in the past month (dependent dichotomous variable) were analysed descriptively using univariate binary logistic regression for Jahra and Kuwait City, and are summarised in Table 8.14.

Independent variables in the univariate analysis of low back pain (dependent variable) were pre-selected as described in Chapter 6.7.2 and are listed in Appendix F. Independent variables that were associated with low back pain in the univariate analysis at $p \leq 0.1$ were included in the multi-variate logistic regression model (see Chapter 6.7.2). SES was included in the multi-variate model for low back pain due to its importance as a potential confounder.

In the univariate analysis, significant association with low back pain in terms of gender was observed in Jahra but not in Kuwait City.

There appears to be a significant association between psychological health (represented by psychological distress and the occurrence of psychosomatic symptoms) and low back pain in both cities. Environmental factors were also of importance in both cities, as living in an area of crime and violence was significantly associated with low back pain in both cities. In Jahra, bullying was significantly associated with low back pain.

Interestingly, none of the lifestyle indicators examined, including physical activity and students being overweight or obese, were significantly associated with low back pain.

Table 8.14: Univariate logistic regression :Association of urban health indicators (UHI) with low back pain (in the past month) in Jahra and Kuwait City

Variables	Jahra			Kuwait City		
	No.	**% ***	**p-value#**	**No**	**% ***	**p-value#**
Demographic Indicators						
Gender:						
Girls	184	67.9%		165	62.7%	
Boys	210	82.4%	**<0.001****	169	64.3%	0.72
	Mean	SD	**p-valueϕ**	Mean	SD	**p-valueϕ**
SES (continuous variable – FAS score)	5.38	1.44	0.57	5.85	1.14	0.64
Health Outcomes/Status						
Psychosomatic symptoms :						
No	299	72.0%		281	61.0%	
Yes	93	86.9%	**0.002****	52	81.3%	**0.002****
	Mean	SD	**p-valueϕ**	Mean	SD	**p-valueϕ**
Psychological Distress: (continuous variable - SDQ score)	15.39	5.28	**<0.001****	13.70	4.96	**<0.001****
Lifestyle Factors						
Obese (BMI ≥ 30 in IOTF cut-off):						
No	284	76.5%		240	65.4%	
Yes	108	71.5%	0.23	88	57.9%	0.12
Overweight or Obese (BMI ≥ 25):						
No	160	75.8%		135	65.5%	
Yes	232	74.6%	0.75	193	61.7%	0.37
Ever Smoked Tobacco						
No	268	75.5%		230	61.5%	
Yes	123	73.7%	0.65	103	68.7%	0.12
Physical activity *≥ 2hrs per week:*						
No	268	76.4%		244	62.9%	
Yes	122	73.4%	0.61	87	66.4%	0.47
Environmental Factors						
Being Bullied ≤twice/past 2 months :						
No	270	72.0%		261	62.3%	
Yes	122	84.7%	**0.003****	71	68.3%	0.26
Involved in a traffic accident:						
No	43	81.1%		25	73.5%	
Yes	45	84.9%	0.61	33	76.7%	0.75
Crime/Violent Area:						
No	269	72.3%		290	61.9%	
Yes	120	81.6%	**0.03****	41	74.5%	**0.07****

*# P-values calculated using chi-square test. Percentages (and numbers) represent young people who were obese from the total sample that answered each choice for every UHI ** P-value = 0.1 included in the univariate analysis. Φ P-Value measured by t-test.*

Multiple logistic regression for low back pain (dependent variable):

To better understand the relationship between urban health indicators and low back pain (as a dependent variable), multiple logistic regression was performed to calculate effect estimates (for adjusted Odds Ratios – OR), as shown in Table 8.15. The predictor (independent) variables included in the multi-variate logistic regression model for low back pain are listed in Appendix G.

In the multiple logistic regression analysis, gender continued to be significantly associated with low back pain in Jahra after fully adjusting for other urban indicators in the multivariate analysis. Girls in Jahra were approximately twice as likely than boys to report suffering from low back pain (OR=1.83; 95% CI=1.16-2.89).

While SES was not significantly associated with low back pain in the multivariate analysis, this finding should be taken with caution to avoid issues with residual confounding.

Psychological distress continued to be independently associated with low back pain in both cities even after the multivariable adjustment for other indicators, with both cities showing a similar picture. An increase in one unit in the SDQ score (measuring the risk of elevated psychological distress) significantly increased the risk of low back pain by 6% in both cities (Jahra OR=1.06; 95% CI= 1.02-1.11; Kuwait City OR=1.06; 95% CI=1.02-1.10). In Kuwait City, the occurrence of psychosomatic symptoms was also independently associated with low back pain. Students in Kuwait City that reported experiencing psychosomatic symptoms (a lot of headaches, stomach aches or sickness in the past 6 months) were 2.21 times more likely to report suffering from low back pain (OR=2.21; 95% CI= 1.12-4.36).

With regards to environmental indicators in Jahra, living in an area with crime and violence continued to be associated with low back pain even adjusting for other indicators in the multivariable analysis. Students in Jahra that reported living in an area with crime and violence were significantly more likely to report suffering from low back pain in the past month (OR=1.69, 95% CI=1.01-2.84). Conversely, none of the environmental indicators examined in Kuwait City were significantly associated with low back pain after the multivariate adjustment (Table 8.15).

Table 8.15: Association between demographic and lifestyle factors with low back pain (dependent categorical variable yes/no).

Variables	Jahra					Kuwait City				
	No.	**%**	**OR**	**95% CI**	**p-value***	**No.**	**%**	**OR**	**95% CI**	**p-value***
Gender:										
Boys	184	67.9%	1.00			165	62.7%	1.00		
Girls	210	82.4%	2.21	1.46-3.30	< 0.001	169	64.3%	1.07	0.75-1.52	0.72
Multivariate Adjustment[$]			1.83	1.16-2.89	0.009					
Psychosomatic symptoms :										
No	299	72.0%	1.00			281	61.0%	1.00		
Yes	93	86.9%	2.58	1.41-4.70	0.002	52	81.3%	2.78	1.44-5.34	0.002
Multivariate Adjustment[$]			1.62	0.85-3.09	0.14			2.21	1.12-4.36	0.02
Being Bullied – at least twice/past 2 months										
No	270	72.0%	1.00			261	62.3%	1.00		
Yes	122	84.7%	2.16	1.30-3.58	0.003	71	68.3%	1.30	0.82-2.06	0.26
Multivariate Adjustment[$]			1.49	0.87-2.58	0.14					
Crime/Violent Area:										
No	269	72.3%	1.00			290	61.9%	1.00		
Yes	120	81.6%	1.70	1.06-2.73	0.03	41	74.5%	1.80	0.95-3.40	0.07
Multivariate Adjustment[$]			1.69	1.01-2.84	0.047			1.77	0.92-3.38	0.08
	Mean	**SD**	**OR**	**95% CI**	**p-value ****	**Mean**	**SD**	**OR**	**95% CI**	**p-value ****
Psychological Distress: (continuous variable - SDQ score)	15.39	5.28	1.10	1.05-1.14	< 0.001	13.70	4.96	1.07	1.03-1.11	< 0.001
Multivariate Adjustment[$]			1.06	1.02-1.11	0.01			1.06	1.02-1.10	0.008
SES (continuous variable – FAS score)	5.38	1.44	1.04	0.91-1.19	0.57	5.85	1.14	1.03	0.89-1.21	0.64
Multivariate Adjustment			1.08	0.92-1.26	0.34			1.06	0.91-1.25	0.46

No = number that reported low back pain in the past month
% = proportion that reported low back pain in the past month
OR = Odds Ratio
SD = Standard deviation
95% CI = 95% Confidence Interval
* = chi-squared test = p-value statistically significant at p≤0.05
** = t-test = p-value statistically significant at p≤0.05
[$] Multivariate logistic regression adjustment performed for independent variables with p≤0.1 in the univariate analysis for both cities

9: Results : Comparing the youth health status in Kuwait City and Jahra to the EURO-URHIS2 project

9.1 Section Overview

To compare the health profiles of youth residing in the cities of Kuwait City and Jahra with those of Europe, 15 key youth urban health indicators (UHIs) that were collected in both the current study and also for the 20 European cities for the EURO-URHIS2 project were compared. These indicators represented three urban health domains: health status, lifestyle factors, and environment.

Results are compared as proportions of each of the 15 UHI in Table 9.1. The proportions in this table are compared overall and separately by gender for Jahra, Kuwait City and the EURO-URHIS2 project (20 cities) for average (mean).

Table 9.1: Comparing 15 Urban Health Indicators in youth health status, lifestyle factors and environment in Jahra, Kuwait City and EURO-URHIS-2 project *

Urban Health Indicator	Jahra (%)			Kuwait City (%)			EURO-URHIS2 Mean % (range low to high %)	EURO URHIS-2 mean (%)	
	Overall	Boys	Girls	Overall	Boys	Girls		Boys	Girls
Health Status									
1. Good self-perceived health	86%	93%	80%	90%	91%	90%	92% (83-98)	93%	90%
2. Elevated risk of psychological problems	22%	16%	27%	13%	11%	14%	20% (8-30)	16%	23%
3. Psychosomatic symptoms	21%	11%	30%	12%	8%	17%	10% (6-14)	6%	14%
4. Low back pain	75%	68%	82%	64%	63%	64%	42% (31-57)	36%	49%
Lifestyle factors									
5. Physical activity	32%	46%	17%	26%	39%	12%	50% (21-71)	62%	37%
6.Regular fruit consumption	30%	29%	31%	34%	36%	32%	49% (35-67)	45%	53%
7. Regular vegetable /salad consumption	48%	46%	51%	42%	41%	43%	52% (38-77)	47%	57%
8. Regular tooth brushing	42%	23%	62%	61%	47%	75%	72% (53-83)	63%	80%
9. Frequently watching TV	58%	56%	60%	50%	52%	48%	60% (37-72)	60%	60%
10. Daily smoking tobacco	10%	19%	1%	9%	17%	1%	12% (4-22)	12%	12%
11. First smoking ≤ 13 years	14%	26%	4%	13%	26%	1%	24% (7-50)	25%	22%
12. Ever used cannabis	2%	4%	1%	3%	5%	1%	16% (1-32)	19%	13%
Environment									
13. Crime/Violence in area	28%	34%	23%	11%	14%	8%	35% (11-55)	38%	33%
14.Involved in traffic accident	11%	13%	8%	9%	11%	6%	7% (3-13)	9%	5%
15. Being bullied	28%	21%	35%	20%	25%	15%	7% (2-14)	7%	6%

*Source: EURO-URHIS 2 project youth survey data (available from http://results.urhis.eu)

1. (%) perceive health as good, very good and excellent. **2.** (%) with SDQ (Strength and Difficulties Questionnaire) score ≥ 20 **3**. a lot of headaches, sickness or stomach aches/past 6 months. **4.** Low back pain in the past month. **5**. Vigorous physical activity ≥ 2 hours/week outside school. **6**. (%) eat fruit most days of week. **7.** (%) eat vegetables and/or salad most days of week. **8**. (%) brush teeth > once/day **9.** (%) watch television ≥ 2 hours/weekdays. **13.** (%) reported crime, violence where they live. **14.** Traffic accident causing injury in past 12 months. **15.** Bullied at least twice/past 2 months.

9.2 Health status:

Whilst Kuwait City had a prevalence of (very) good or excellent self-perceived health similar to that of the EURO-URHIS 2 project mean (at 90% and 92% respectively), Jahra appeared to have generally a lower prevalence of (very) good or excellent self-perceived health, similar to the city with the lowest prevalence of self-perceived (very) good/excellent health in Europe (at 86% and 83% accordingly).

Interestingly, the disparity in (very) good/excellent self-perceived health observed between girls and boys for Jahra (at 80% and 93% respectively) was not observed in Kuwait City or in the EURO-URHIS 2 project where proportions by gender were similar. A similar proportion of boys reported (very) good/excellent self-perceived health in Jahra and Europe compared to a 10% lower prevalence in girls in Jahra than the EURO-URHIS 2 project mean for girls.

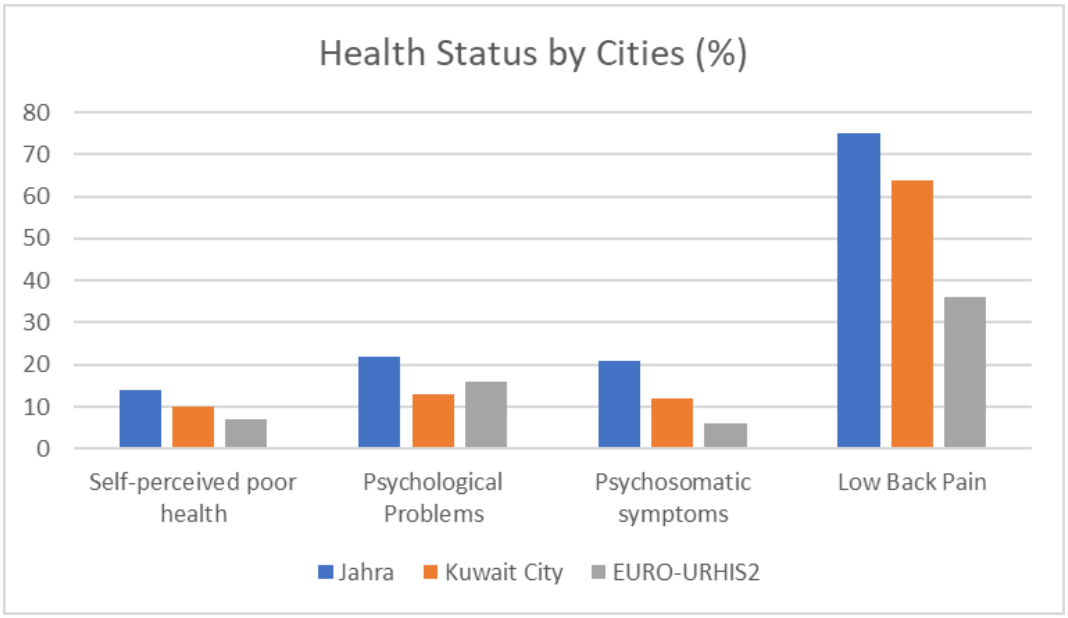

Figure 9.1: Self-reported health status UHIs in Jahra, Kuwait City and the EURO-URHIS-2 youth survey mean (expressed as %).

Overall, a larger proportion of youth were at an elevated risk of psychological problems (SDQ score ≥ 20) in the EURO-URHIS2 project compared to Kuwait City, at 20% and 13% respectively. On the other hand, the percentage of youth in Jahra that were at an elevated

risk of psychological problems was higher than the EURO-URHIS mean at 22% (Figure 9.1). Again, the disparity between boys and girls persisted in Jahra, with girls reporting a higher prevalence of self-reported risk of psychological problems than boys (27% and 16% respectively).

Students in Kuwait City reported a similar percentage of psychosomatic symptoms in the past six months (headache, stomach ache or sickness) compared to the EURO-URHIS2 project mean (at 12% and 10% accordingly). However, the proportion of students in Jahra that self-reported psychosomatic symptoms in the past 6 months was higher than the European mean at 21% (Figure 9.1). Furthermore, the proportion of girls in Jahra that reported psychosomatic symptoms in the past 6 months was 16% higher than the proportion that was self-reported in girls in Europe (at 30% and 14% accordingly).

With regards to low back pain in the past month, self-reported rates were considerably higher in both Kuwait City and Jahra compared to the highest prevalence reported in the EURO-URHIS2 project (at 64%, 75% and 57% respectively) (Figure 9.1). Whilst the proportion of students that reported suffering from low back pain was still highest in Jahra (3 out of 4 youths compared to less than half in the European mean), this UHI was still common in Kuwait City (approximately two thirds of the youth). As with previous health status factors, self-reported low back pain appeared to be higher in girls than in boys.

In summary, in terms of health status UHIs, Kuwait City appears to show a similar picture to that of the EURO-URHIS2 project average, with the exception of low back pain where it has been reported higher than in Europe (Figure 9.1). On the other hand, students in Jahra have presented higher rates of adverse health status attributes than Kuwait City and the European mean, with girls reporting higher rates than boys.

9.3 Lifestyle factors:

The percentage of students that self-reported participating in vigorous physical activity (for ≥ 2 hours/week outside school) was lower than the EURO-URHIS-2 project mean (50%) in Jahra and Kuwait City, at 32% and 26% accordingly (Figure 9.2). However, the prevalence of self-reported vigorous physical activity in boys in Jahra was similar to the European mean, at

46% and 50% accordingly (Table 9.1). While boys in Kuwait City self-reported a higher prevalence of vigorous physical activity than girls, it was approximately 10% lower than the overall European mean. In contrast, a lower proportion of girls in both Jahra (17%) and Kuwait City (12%) engaged in vigorous physical activity than the lowest reported mean in the EURO-URHIS-2 study.

A smaller proportion of students in both Jahra and Kuwait City reported regular fruit consumption on most days of the week than the European mean (50%), at 30% and 34% respectively (Figure 9.2). Likewise, regular vegetable and/or salad consumption (on most days of the week) was reported lower in youths in Jahra and Kuwait City than the average EURO-URHIS2 project average (52%), at 48% and 42% accordingly (figure 9.2).

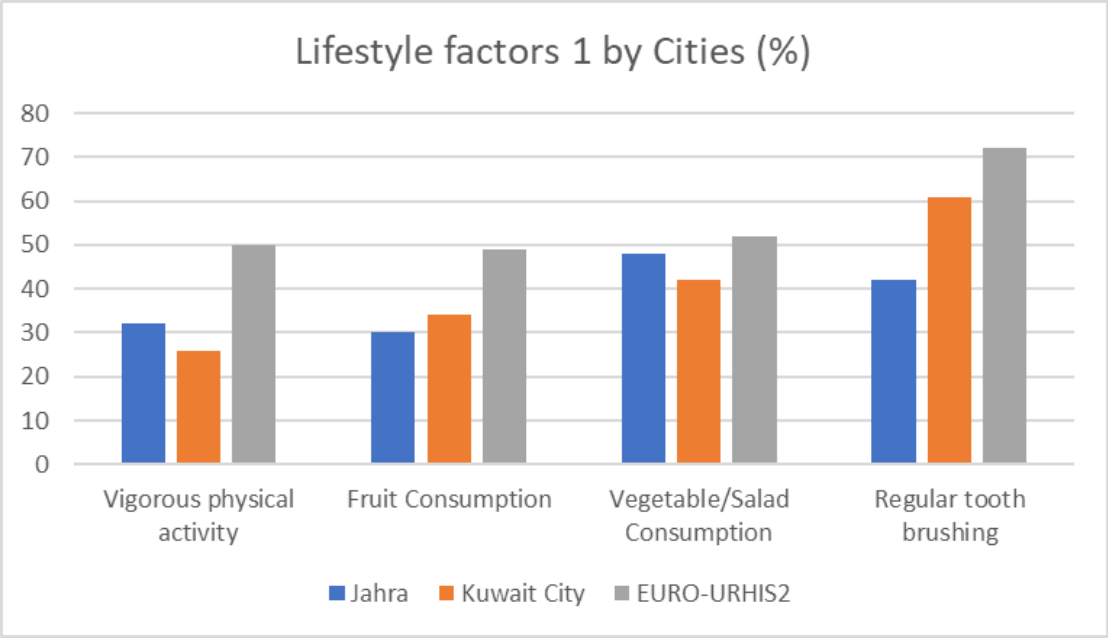

Figure 9.2: Self-reported lifestyle factors (physical activity, regular fruit/vegetable/salad consumption and regular tooth brushing) in Jahra, Kuwait City and the EURO-URHIS-2 youth survey mean (expressed as %).

Regular tooth brushing (more than once a day) was reported by a lower proportion of students in Kuwait City (61%) and Jahra (42%) than the EURO-URHIS-2 project mean at 72% (Figure 9.2). In the case of Jahra, a smaller proportion of students self-reported regular tooth brushing than the lowest European mean at 53%. The proportion of girls in Kuwait

City that regularly brushed their teeth was similar to the prevalence reported in girls in the EURO-URHIS-2 project (at 75% and 80% respectively). On the other hand, the prevalence of boys in both Kuwait City (47%) and Jahra (23%) that self-reported brushing their teeth regularly was lower than the overall European mean reported for boys (63%).

With regards to watching television, the proportion of students in Jahra that watched television for ≥ 2 hours on weekdays was similar to the EURO-URHIS-2 project mean (at 58% and 60% accordingly). In Kuwait City, the prevalence of regular television watching on weekdays was 10% lower than the European mean (Figure 9.3).

Daily smoking tobacco was self-reported similarly in Jahra (10%) and Kuwait City (9%) compared to the EURO-URHIS2 project mean of 12% (Figure 9.3). However, the percentage of boys that reported smoking daily in Jahra (19%) and Kuwait City (17%) was higher than the overall European mean and the self-reported prevalence in boys in Europe at 12% (Table 9.1). On the other hand, the proportion of girls that were daily smokers in Jahra (1%) and Kuwait City (1%) was lower than all cities in the EURO-URHIS2 project and almost 10% lower than the mean prevalence in girls in Europe.

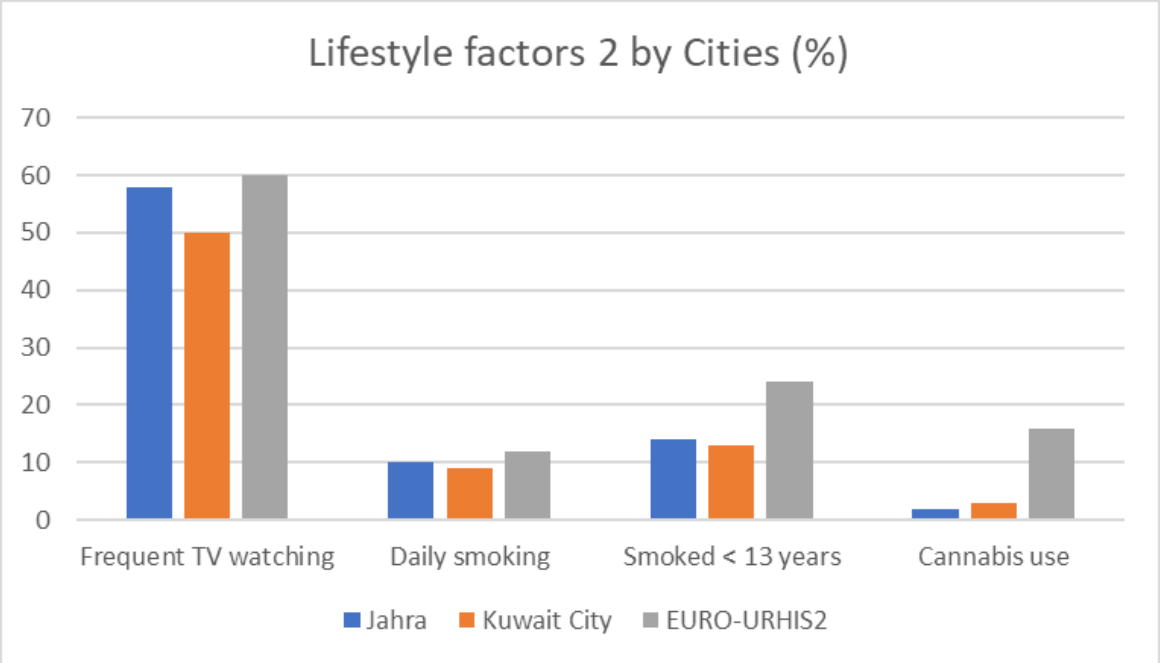

Figure 9.3: Self-reported lifestyle factors (frequent TV watching, daily smoking, smoked younger than 13 years and ever using cannabis) in Jahra, Kuwait City and the EURO-URHIS-2 youth survey mean (expressed as %).

Overall, a smaller proportion of youths in Jahra (14%) and Kuwait City (13%) started smoking tobacco ≤ 13 years than the EURO-URHIS-2 project mean (24%) (Figure 9.3). However, the proportion of boys in Jahra (26%) and Kuwait City (26%) that first smoked ≤ 13 years was similar to overall EURO-URHIS-2 project mean. As with daily smoking tobacco, girls reported a lower prevalence of smoking tobacco ≤ 13 years than boys in both Jahra and Kuwait City. The percentage of girls in both Jahra (4%) and Kuwait City (1%) that smoked ≤ 13 years was lower than the lowest self-reported mean in the EURO-URHIS-2 project (7%).

Self-reported cannabis use did not appear to be an issue in Kuwait City and Jahra and was reported lower than the EURO-URHIS2 project mean. Only 2% and 3% of students self-reported ever using cannabis in Jahra and Kuwait City accordingly, compared to 16% of students in the EURO-URHIS-2 study mean (Figure 9.3).

In summary for UHIs in lifestyle factors, while the overall prevalence of self-reported vigorous physical activity was lower in Kuwait City and Jahra than in the European mean in the EURO-URHIS2 project, the prevalence appeared to be considerably lower in girls for both cities compared to Europe. Regular fruit consumption was lower in Jahra and Kuwait City than the European mean, while regular vegetable/salad consumption was similar to the European mean in Jahra but lower in Kuwait City. In terms of dental care, lack of regular tooth brushing appeared to be a bigger issue in Jahra and Kuwait City compared to the European mean, particularly in boys in Jahra. With regards to daily smoking tobacco, the prevalence in Kuwait City and Jahra appeared to be similar to the European mean for boys only, while the prevalence for this UHI was lower than the European mean for girls in both cities. Self-reported cannabis use did not appear to be an issue in Kuwait City and Jahra in comparison to the mean in the EURO-URHIS2 project.

9.4 Environment:

While self-reported violence, crime and vandalism was higher in Jahra (28%) compared to Kuwait City (11%), students in both cities reported less violence, crime, and vandalism in their area than the EURO-URHIS-2 project mean (35%) (Figure 9.4). In Kuwait City, the

proportion of students who reported living in an area with crime and violence was the same as the lowest proportion reported in the EURO-URHIS-2 project.

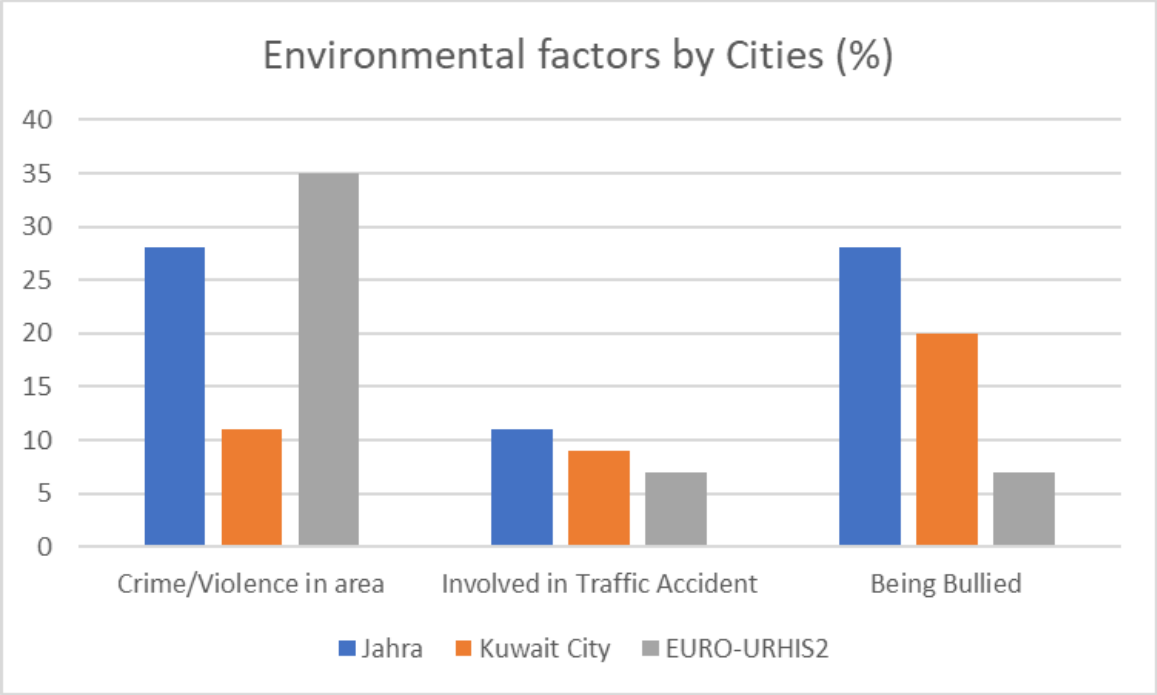

Figure 9.4: Self-reported environmental factors (crime and violence in living area, involvement in a road traffic accident, and being bullied at least twice/past 2 months) in Jahra, Kuwait City and the EURO-URHIS-2 youth survey mean (expressed as %).

A slightly higher proportion of youths in Jahra (11%) and Kuwait City (9%) were involved in a road traffic accident that resulted in an injury in the past 12 months than the EURO-URHIS-2 project mean (7%) (Figure 9.4). 13% of boys in Jahra reported getting involved in a road traffic accident that resulted in an injury, which was equal to the highest proportion recorded in the EURO-URHIS2 project.

Whereas self-reported bullying was higher in Jahra than in Kuwait City, this UHI appeared to be more of an issue for youths in these two cities than in Europe (Figure 9.4). The proportion of students who were victims of bullying (at least twice in the past couple of months) was 28% and 20%, in Kuwait City and Jahra respectively, compared to a mean of 7% in the EURO-URHIS-2 project. Furthermore, the proportion of students who reported being victims of bullying in Jahra and Kuwait City was higher than the larger proportion of self-reported bullying in Europe (14%). The gender differences observed in bullying in Kuwait

City and Jahra, with girls self-reporting being victims of bullying more than boys in both cities, were not observed in the EURO-URHIS2 project.

To summarise, there are clear environmental UHI differences between Kuwait City, Jahra and the European cities in the EURO-URHIS2 project. While crime, violence and vandalism were self-reported higher in Jahra compared to Kuwait City, the prevalence was lower than the European mean. On the other hand, bullying appeared to be more of an issue in Jahra, (and to a lesser extent in Kuwait City) compared to Europe, particularly in the high prevalence reported by girls. Finally, the proportion of students who were involved in a road traffic accident was slightly higher than the European mean.

10: Discussion

10.1 Urban Health Profiles - Summary of the main findings:

Health status and health outcome factors:

Urban health indicators representing the health and determinants of health in young people living in the cities of Kuwait City and Jahra showed quite stark differences in the living experience between the two cities. While no official statistics or measures of deprivation are published by the Government of Kuwait, the findings of this study have shown that Jahra clearly had a socio-economic profile that indicated greater deprivation than in Kuwait City (denoted by the Family Affluence Scale - FAS II - scores). While low SES was not widely reported in both cities, the proportion of students that that reported a low family affluence score was three-fold higher in Jahra compared to Kuwait City. Additionally, the proportion of youths from higher socio-economic status families was significantly larger in Kuwait City (67%) compared to Jahra (54%).

When looking closely at the health profiles of each city, there were clear differences in terms of health experience and wider determinants of health. In Jahra, a significantly higher proportion of young people reported poor self-perceived health, inadequate oral healthcare, a wheeze in the chest (a symptom commonly observed in bronchial asthma), and allergic rhinitis, than in Kuwait City. Furthermore, the additional burden of certain health conditions, such as weekly sleep disturbances in bronchial asthma sufferers, was more than two-fold higher in Jahra compared to Kuwait City. Interestingly, a clinical diagnosis of bronchial asthma was reported higher in Kuwait City than in Jahra, although this could possibly be attributed to diagnostic bias from healthcare providers when examining child that presents with a wheeze in the chest.

Lifestyle factors:

For lifestyle factor indicators, there were several important differences in this study between the two cities. Overall, unhealthy eating habits presented an alarming finding and were widely reported in both cities, with a poorer picture in Jahra compared to Kuwait City. In Jahra, a significantly higher proportion of youths regularly consumed fizzy drinks and low calorie drinks, sugar coated cereals, crisps and chips (on most days of the week), than in Kuwait City. Also, a significantly larger proportion of students in Jahra reported rarely or never eating wholemeal bread compared to Kuwait City.

One of the important dietary observations in this analysis was low consumption of regular fruit and vegetable reported by youth in both cities. In terms of regular fruit consumption, only approximately one third of students in both cities consumed fruits on most days of the week. Furthermore, less than half of the youths in both cities reported consuming vegetables and/or salads on a regular basis.

A worrying observation was the high prevalence of frequent television watching in both cities, a sedentary lifestyle factor that may contribute towards a lack of physical activity and childhood obesity. As with other lifestyle factors, a significantly larger proportion of youths reported watching television on weekdays for more than 2 hours in Jahra compared to in Kuwait City.

A key observation that should be commented on was the lack of engagement in daily and vigorous physical activity in most youths in both Jahra and Kuwait City. Overall, only one third of youths in Jahra and one fourth in Kuwait City engaged in vigorous physical activity (≥2 hours/week outside school) and less than 10% reported at least 60 minutes of physical activity per day in the past week as recommended by the World Health Organisation for their age group. Interestingly, the proportion of girls who engaged in vigorous physical activity was much lower than boys in both cities, with boys reporting threefold higher weekly vigorous physical activity compared to girls in both cities.

Environmental factors:

Several important findings and stark differences between Jahra and Kuwait City were observed in this analysis with regards to environmental factors. The findings in the

environmental urban living conditions in Jahra clearly indicated a worse situation in the household and school environment and presented youths with more urban health challenges compared to Kuwait City. One such example is the significantly higher proportion of students in Jahra who reported crime, violence, and vandalism in their neighbourhood, which was approximately threefold higher than in Kuwait City. Additionally, significantly more youths reported experiencing severe outdoor noise in their home in Jahra than in Kuwait City.

Also of concern within the wider context of the urban environment was road safety in Jahra due to the higher proportion of youths in the city (21%) who reported being involved in a road traffic accident compared to Kuwait City (15%), half of which required medical intervention. The high prevalence of road traffic accidents in Kuwait is well-documented in the literature as major public health concern, with external causes of mortality including road traffic accidents being the third most common cause of mortality in the country [199]. However, while the prevalence of road traffic accidents is known at a country level, little is known of its occurrence in the young population as car passengers and/or pedestrians. Moreover, city level statistics are not available in the country.

The prevalence of bullying in schools was alarming in both cities, particularly in girls. The school "environment" in Jahra presented a more negative picture compared to Kuwait City. This was clearly indicated in the significantly higher proportion of youths in Jahra who were victims of bullying, which was approximately 10% higher than in Kuwait City. Additionally, girls in Jahra were also significantly more likely to report bullying others, than girls in Kuwait City.

Health Situation for girls in Jahra:

An important observation from our analysis was the poor health situation for girls in Jahra (both in terms of health and determinants of health). In terms of self-perceived health, one fifth of girls in Jahra reported their general health as poor or average compared to only one in ten in Kuwait City. Compared to Kuwait City, significantly more girls in Jahra reported suffering from a wheeze in the chest and experienced an itchy skin condition, as well as a

significantly higher burden of symptoms that commonly accompany allergic rhinitis and bronchial asthma. Taking bronchial asthma symptoms as an example, approximately 1 in 3 girls in Jahra reported suffering from a wheeze in the past compared to 1 in 5 in Kuwait City.

The more negative health situation for girls in Jahra was also observed in lifestyle and environment urban health indicators. For example, significantly more girls frequently watched television (for > 2 hours) in Jahra, which was reported 12% higher than in Kuwait City. In terms of the household environment, it was observed in our analysis that girls were more likely to report outdoor noise at home when compared to boys in the same city, with the highest prevalence reported in girls in Jahra. The school environment also appeared to be more difficult for girls in Jahra, as a significantly higher proportion of girls in Jahra reported being victims of bullying, which was more than twofold higher than in Kuwait City.

Jahra as a less affluent area

It is important to note that there is little health information available for young people living in Kuwait at a national level and in its main cities. This study has therefore provided valuable data to understand the health priorities (both in terms of health outcomes and wider determinants of health) in the different urban contexts of Jahra and Kuwait City.

The demographic structure of Jahra as a less affluent or deprived area in comparison to Kuwait City, or other cities within the country, has been reported by the grey literature (including local newspapers) in Kuwait [279, 280]. At an official level, there are no deprivation or socio-economic status measures provided by the Government of Kuwait and no demographic breakdowns were available from the literature search.

In this study, it was evidence that young people taking part in the survey in Jahra came from families with significantly lower socio-economic status than those from Kuwait City. These suggested social and economic inequalities have also been highlighted in the grey literature, such as in leading newspapers in the country [280]. However, no previous studies were identified that attempted to measure or address socio-economic status in young people in both cities or to understand its potential impact on health inequalities at an inter-city or intra-city approach.

Evidence from other countries within the Arab States has suggested that younger women (in their late teens to mid-twenties) in less affluent areas were more likely to report poor self-reported health than men with the gap between sexes being less marked in more affluent areas [230]. Previous researchers have proposed a link between the social and cultural aspects in the Arab States associated with classic patriarchy and the increase in gender and health inequalities in less affluent areas [4].

In this study, while a significantly larger proportion of young people in Kuwait City reported their health to be (very) good or excellent than in Jahra, the difference between the two cities was even more pronounced in girls. The literature review has not yielded previous research that has attempted to assess self-perceived health in Kuwait at a country or city level in young people. Nevertheless, the findings from the limited studies in the Arab States should be interpreted in light of the inter-city and intra-city sex differences observed in this study. It is also worth noting that previous studies have suggested that the tribal background of Jahra (approximately 80% of the city population compared to 4% in Kuwait City), with a stronger representation of patriarchy and son preference could play a part in the gender differences between Kuwait City and Jahra, although these cultural factors are still not fully understood [194, 230].

Previous studies have associated Jahra with higher rates of violent, drug and vandalism-related crimes and official Kuwaiti government statistics have shown similar observations with the city having the highest rate of crime rate in the country [259,281]. These findings correspond with the findings of this research. Other environmental urban health indicators that were reported higher in Jahra, such as exposure to severe noise and living close to a busy road, were not assessed in any previous studies at a country or city level.

Previous epidemiological inter-city studies comparing Kuwait City and Jahra are extremely limited in adults and even less so in young people. In an older study on oral health with an inter-city approach, younger children in Jahra were reported to have poor oral hygiene compared to the rest of the country [283]. While most urban health indicators presented a more negative picture for girls in Jahra, one exception was oral health, which was poorer for boys in both cities. Despite poor oral health practices (represented by tooth brushing less than twice a day) appeared to be a major issue for both cities in boys, the situation was

significantly worse in Jahra. In our study, only one in four boys in Jahra compared to one in two boys in Kuwait City reported brushing their teeth regularly. It is also worth noting that girls in Kuwait City reported significantly better oral health care by brushing their teeth regularly than those in Jahra. This observation was not researched in previous studies in the country.

Kuwait City and Jahra health profiles compared to Europe:

Comparing the health profiles of Jahra and Kuwait City with European cities (in the EURO-URHIS2 project) highlighted some interesting contrasts. It was clear that for many urban health indicators, that youths in Jahra had the poorest health, lower than the overall mean for Europe but also lower than the average in European cities with the poorest self-reported indicators (lowest in the range in the EURO-URHIS2 project). In contrast, Kuwait City was similar to the European average (and closer to European cities with better self-reported health) for several urban health indicators, including good self-perceived health, elevated risk of psychological problems, psychosomatic symptoms, road traffic accidents, and self-reported crime/violence in their area.

One of the most important findings from this research was the substantial prevalence of low back pain (in the past month) reported by the majority of youths in Jahra and Kuwait, especially when compared to the lower prevalence reported in Europe. Overall, 75% and 64% of youths reported suffering from low back pain in the past month, in Jahra and Kuwait City respectively, compared to 42% in the EURO-URHIS2 project mean. This particular indicator is considered in more detail in Section 10.2 of the discussion.

10.2 Kuwaiti Government Policy Health Indicators:

An important objective of this study was to provide data on key youth urban health indicators for three priority health areas identified by the Kuwaiti government as areas of focus in their ongoing Healthcare Legislative Plan. These areas were overweight and obesity, tobacco smoking and cannabis use, and general mental and psychological health in young people. This section will consider the findings from the results which are relevant to Kuwaiti government policy and recommendations. Due to the broad spectrum of general mental

and psychological health as a health policy priority, it will also consider health issues that appear to be an important public health concern and may play a role informing this governmental priority.

A) Overweight and Obesity (priority 1) :

Based on measured height and weight, the findings of this study demonstrate that most of the surveyed students were overweight and obese, with 3 out of 5 students measured as obese or overweight (BMI ≥ 25) in both cities. Additionally, approximately 1 in 3 of students in both cities were obese (BMI ≥ 30). While studies in adults have placed the general Kuwaiti population with one of the highest overweight rates globally, at approximately 80%, little was known of the current situation in young people prior to this research.

Existing literature to compare is limited at a country level. In the latest Global School-Based Student Health Survey (GSHS) questionnaire conducted in 2010 in schools in Kuwait on young people aged 13-15, the self-reported overweight prevalence rates were 55% and 46%, in boys and girls accordingly [188]. In the same survey, 25% of boys and 19% of girls reported that they were obese. It should be noted that the GSHS questionnaire 2010 did not attempt to objectively measure height and weight and these findings were self-reported measures by the students. Previous research has found that adolescents are prone to underestimate their BMI, particularly if they are overweight or obese [253]. Hence, there is a concern in the validity of comparing the results obtained in the self-reported overweight and obesity prevalence rates in the GSHS questionnaire with the objective height and weight measurements conducted in our study.

Prior to our study, the latest research that sought to measure height and weight objectively in young people in Kuwait was conducted in 2004 on youths aged 10-14. In that research, approximately 30% of children were found to be overweight and obese and 14% were obese[4]. While there has been an overall increase in global youth obesity over the past decade, it is important to note that the alarming prevalence rates of overweight and obesity measured in our study have to be addressed and analysed for future trends.

Despite the limited research available in the Arab States on overweight and obesity in young people, the findings in this study suggest that the two cities have some of the highest prevalence rates of overweight and obesity recorded in the region. In comparison to other countries in the region, adolescent overweight rates were recorded as 45% and 37%, in Saudi Arabia and Lebanon accordingly [4]. In another study in Khobar city in Saudi Arabia, obesity was found in 20% of girls and 15% of boys [178].

With regards to the findings in the EURO-URHIS2 study, the mean proportion of youths who were overweight and obese for the cities that participated in that study was 13% [282]. In England, one in three children aged 11-15 were overweight or obese compared to three in five in this study in Jahra and Kuwait City [284]. This represents a considerable difference between the situation in Europe and the proportions measured in Jahra and Kuwait City for this youth urban health indicator.

As expected, both daily and weekly vigorous physical activity were negatively associated with obesity in Kuwait City (daily exercise: OR= 0.33; Vigorous physical activity: OR= 0.41). However, this association was not observed in Jahra. The Ministry of Health (Kuwait) has cited lack of adequate physical activity as one of the issues to tackle in their current Healthcare Legislative Plan in reducing overweight and obesity levels in children [174]. In a survey conducted in Kuwait City on children aged 10-14, lack of adequate physical activity and unhealthy eating habits were proposed as factors that caused overweight and obesity[281]. In the GSHS questionnaire 2010, approximately 20% of young people in Kuwait reported engaging in 60 minutes of physical activity per day compared to only 9.0% and 7.8% in our study, in Kuwait City and Jahra accordingly [188]. It is worth noting that the results from the GSHS questionnaire included youths from all the governorates in the country and all respondents were pooled, preventing inter-city and intra-city comparisons.

While the overall diet of students was not assessed in detail in our study, it has presented important findings that may contribute towards childhood and adolescent obesity, for example, following a specific diet was negatively associated with being obese in both cities (Jahra: OR= 0.25; Kuwait City: OR= 0.23). Studies examining dietary and nutritional factors in young people are limited in Kuwait and the Arab States, although changing dietary habits in the region from a traditional “Mediterranean” diet into a more Westernised diet are

documented in the literature [4]. Whilst regular fruit and vegetable/salad consumption was not examined in the same methodology of this study in Kuwait, previous studies have suggested inadequate fruit and vegetable consumption at a country level. In a previous study in Kuwait, only 22% of young people aged 13-15 consumed 5 daily portions of fruit and/or vegetables per day as recommended by the WHO [188]. Consumption in that study was not assessed in an inter-city or intra-city approach. Despite the different methodology used to assess regular fruit and vegetable consumption in our study, only 1 in 3 students reported regular fruit consumption on most days in Jahra and Kuwait City, and less than half consumed vegetables and salads on a regular basis. In comparison, the EURO-URHIS2 mean for students that reported regular fruit consumption was 49% and 52% reported regular vegetable and/or salad consumption [282].

One of the interesting findings in our study was the independent association of gender with obesity, where boys were more likely to be obese than girls in both cities (Jahra: OR= 1.69; Kuwait City: OR= 3.00). This observation was not witnessed in other parts of the Arab States. In fact, previous research has suggested that overweight and obesity was more prevalent in adolescent girls than in boys, particularly in other rich GCC countries, such as Qatar and Saudi Arabia [4].

Overweight and obesity: a public health concern

In terms of policy, the problem of overweight and obesity appears to be a major concern in both cities, with the issue requiring an immediate action at a country level. These results confirm the importance of this particular public health issue in light of the dearth of evidence at a country and regional level.

It is important to note that the drivers and determinants of childhood and adolescent obesity are complex and generally involve a combination of behavioural, lifestyle, psychosocial and cultural factors [285]. However, the results from this research point to two possible drivers of global importance in determining childhood obesity: unhealthy dietary intake and low engagement in physical activity. As previously mentioned, unhealthy dietary factors were widespread in both cities, particularly in the high consumption of sugar-rich

products and fizzy drinks and the low consumption of fruits and vegetables. Low engagement in physical activity, an issue found to associated with obesity in Kuwaiti adults, was widely reported in both cities, with less than 1 in 10 students engaging in the WHO recommended daily physical activity [249]. The implications of not addressing childhood obesity will potentially carry a huge economic burden on the country's healthcare system, especially one dependent on public funding as in Kuwait. Childhood and adolescent obesity increase the chance of obesity in adulthood, and this in turn increases the risk of type-2 diabetes, hypertension, cardiovascular disease, and some forms of cancer [285]. However, it is important to note that the complications of obesity could appear early in life and present before adulthood [285]. Furthermore, with increasing prevalence of obesity, the medical and surgical treatments of obesity (including bariatric surgery) will place additional burden on the health sector.

The WHO recommends that efforts of tackling childhood and adolescent obesity should ideally start early, with primary prevention starting at pre-conception and during pregnancy, with a focus on young women to promote physical activity and a healthy body weight and nutritional status [285]. Maternal overweight/obesity as well as high adiposity at birth have been found to be linked to childhood and adolescent obesity, therefore efforts should start before pregnancy [285] [286]. This carries an importance in Kuwait and other Arab States, where there is evidence of cultural misconceptions towards increasing caloric intake through unhealthy dietary habits during and after pregnancy [4].

Encouragement of breastfeeding has also been presented as an important area of intervention by the WHO to promote healthy eating, as there is growing evidence that children that are breastfed are more likely to accept and try new food products, including fruits and vegetables, as opposed to those that are formula fed [285]. Children naturally prefer sweet and salty food products, and the role of their parents is crucial at this early stage in shaping their future food preferences [285]. With the rapid urbanisation witnessed in Kuwait and the Arab States, as well as the widespread availability of infant formula use and the decline in breastfeeding, encouragement of breastfeeding and addressing its barriers should be considered in this setting by public health policy makers.

Efforts to prevent overweight and obesity in young people should attempt to reduce population BMI instead of focusing only on individuals that are overweight/obesity or at risk [285]. There is evidence in children that age can have an impact on the success of interventions to prevention of obesity through reducing BMI. According to a Cochrane review conducted in 2011, there was "strong evidence" that community based preventive measures for childhood obesity were the most beneficial between the ages of 6-12 years old in school settings [285] [287]. Waters et al found that school-based interventions that were found effective focused on increasing the amount of physical activity and providing healthy foods in schools, improving school curriculum in terms of nutritional habits and physical activity, and developing the skills of teachers and parents to encourage and support students in preventing childhood obesity [285] [287]. An example of a successful intervention that were done in educational settings in that age group, with a focus on adjusting dietary habits and increasing physical activity and the involvement of school teachers, was the "Planet Health" interdisciplinary intervention in the United States [285] [288]. A second example of a successful community-based intervention is EPODE programme (Together Let's Prevent Childhood Obesity) that originally started in France but has been implemented in 15 countries with a focus on children between 5-12 years old to promote heathier dietary factors and physical activity specifically tailored to the local community's needs [285] [290].

While interventions were most effective between the ages of 6-12 years, Water et al. have also identified effective programmes that have been successful in other age groups. For example, The Healthy Beginnings Trial in Australia, conducted on children below the age of two years through home-based interventions, resulted in a reduction of BMI and an increase in healthy eating habits [285] [287] [289]. With regards to interventional studies in kindergarten and pre-school children, interventions in that age group showed a higher reduction of childhood BMI when parents were involved in home-based settings [285, 289]. It is important to note in the 2011 Cochrane review, Waters et al. concluded that school-based obesity interventions have not presented any evidence of increasing health inequalities [285, 287].

In terms of treating children and young people suffering from obesity, the evidence also points towards behavioural and lifestyle changes to be most effective in children aged 5 to

12 years old. It appears that family-focused behavioural changes in dietary habits and physical activity are more effective when parents are involved [285, 291]. In older children, particularly in the age group studied in our research, there appears to be a growing role for medical and surgical treatments used in conjunction with behavioural and lifestyle interventions [285]. At a global level, an important limitation is the general lack of guidelines and evidence-based healthcare models for treating childhood and adolescent obesity [285]. However, efforts to tackle this are changing. For example, in the UK, the National Institute for Health and Care Excellence (NICE) have proposed guidelines on managing childhood and adolescent obesity, with an emphasis on family-based behavioural and lifestyle changes as well as training healthcare providers to address this public health issue [285, 292].

The concept of "nutrition literacy" can have a role in addressing childhood and adolescent obesity. Nutrition literacy can be defined as "the degree to which individuals can obtain, process, and understand the basic nutrition information and services they need to make appropriate nutrition decisions" [293]. There is evidence that nutrition literacy can have impact on food purchasing and dietary choices for parents and their children [285]. One of the commonest methods of improving nutrition literacy is by food labelling, such as the "traffic light system" used in the UK and other countries, that offer an easy to understand coding system for consumers [285]. Some countries have also taken novel approaches in improving nutritional literacy for specific food items that are deemed important for young people, such the labelling of "snacks" in China and "beverages" in Mexico [285, 294]. Currently, there are no efforts in Kuwait or within the Arab States to improve nutritional literacy through similar methods, and food labelling is not present or regulated through governmental and policy interventions.

B) Tobacco smoking and cannabis use (priority 2) :

Tobacco smoking and cannabis use in young people were highlighted as a priority for the Kuwaiti government Healthcare Legislative Plan. In the current study, (ever) smoking appeared to be predominantly an issue for boys rather than girls in both Jahra (OR=11.05)

and Kuwait City (OR=9.80). These findings corresponding to previous research gender differences in ever smoking tobacco in most of the countries within the Arab States, with boys are likely to smoke than girls [4] .

The gender difference was more pronounced when looking at daily smoking behaviours. Daily smoking was reported by approximately 1 in 5 of boys in both cities, compared to only 2% in girls. This places the proportion of boys that smoke daily in Jahra and Kuwait City to be higher than the EURO-URHIS2 mean for boys of 12% [282]. Of particular concern, is that smoking before the age of 13 years was reported by approximately 15% of youths in Jahra and Kuwait City, respectively.

Environmental factors seemed to play a part in the risky health behaviour of tobacco smoking. Living in an area with crime, violence and vandalism was independently associated with (ever) smoking tobacco in both cities (Jahra: OR= 1.91; Kuwait City: OR= 1.88). It is important to note that these findings could be confounded by low SES, a driver known to influence tobacco use in young people.

A possible important driver associated with smoking in Jahra was poor psychological health. In this research, increase in one unit of psychological distress (denoted by Strength and Difficulties Score – SDQ) was independently associated with an increased risk of ever smoking tobacco of 9% in Jahra.

Much of the limited evidence of tobacco smoking in young people in Kuwait and the rest of the Arab States comes from the data in the Global Youth Tobacco Survey (GYTS). It is important to note that the young people surveyed in the GYTS were from all governorates in Kuwait and the data did not provide any city comparisons.

In the latest survey conducted in Kuwait in 2009, 39% and 18% had tried smoking tobacco in the past, in boys and girls respectively [247]. These findings were lower than those reported in boys in our study, where approximately 50% reported ever smoking tobacco in the past in both cities. However, the proportion of girls who reported smoking in the GYTS 2009 was higher than that observed in this research, at 12% and 8% in Jahra and Kuwait City respectively.

For youths in the Arab States in their respective GYTS, the proportion of boys who reported ever smoking tobacco in the past was recorded as highest in Kuwait, followed by Saudi Arabia and UAE, at 39%, 36% and 34% respectively [236]. Hence, this places the findings reported in our survey for boys who 'ever smoked' tobacco to be higher than previous studies in similar age groups.

In the most recent Global Youth Tobacco Survey (GYTS) report for the State of Kuwait, boys were also more likely to be current tobacco smokers than girls, and the prevalence of boys who currently smoked was one of the highest recorded in the Arab States in the GYTS [247, 257].

Whilst cannabis use in young people is part of the ongoing Kuwaiti Healthcare Legislative policy, it did not appear to be an issue that was widely reported by youths in this study. From all the youths surveyed, only 3% reported ever using cannabis in the past in both cities. This proportion reported in both cities was lower than the EURO-URHIS2 study mean, where 16% of students reported cannabis use in the past [282] It is important to note that in Kuwait such drug use carries severe legal consequences. The Kuwaiti penal law on illicit drugs use does not classify substances based on categories and/or severity as in countries like the UK [258]. Hence, from a legal perspective, the use of cannabis can carry the same prison sentence (a maximum of 2 years) as the use of heroin. Despite efforts taken in this research to inform students of the anonymity of their data, both verbally at the start of the survey and in written form within the questionnaire, the considerable legal implications of admitting drug use have to be considered. Therefore, estimates of cannabis use based on the self-reported data in our study are likely to be underestimates given these considerations.

The literature review has not yielded other studies that have examined self-reported cannabis use in Kuwait at a country or city level. Moreover, the Ministry of Health in Kuwait does not provide official statistics in terms of cannabis use or other illicit drug use in young people. While some knowledge exists of smoking habits in the Arab States, very little is known about cannabis use in young people in the region.

Tobacco smoking : an important public health concern

Tobacco smoking is one of the most important preventable causes of mortality and morbidity worldwide [295]. As previously mentioned, the implications of tobacco smoking in young people can carry serious long term consequences, as most continue to smoke as adults, causing heart disease, stroke, lung cancer and other non-communicable diseases [295] . In addition to causing an addiction to nicotine, smoking in young people is also linked to an increased risk of harmful alcohol intake and illicit drug use, such as cannabis and cocaine [295]. In light of the findings presented in our research with regards to tobacco use, and the global importance of this particular public health issue, efforts to tackle tobacco use should remain a priority for policy makers in the State of Kuwait.

While the drivers of tobacco use in young people are generally difficult to identify, potential drivers in Kuwait from our findings could possibly be associated with the physical and social environment, as well as mental health. With the shortcomings of governmental and health sector involvement in implementing effective strategies, both in terms of upstream, midstream, and downstream interventions to address tobacco smoking, there is a risk that tobacco use is viewed as an acceptable practice [296]. Also, parental smoking should be considered, as smoking prevalence rates among male Kuwaiti smokers are relatively high compared to other countries in the region (at 39%) [297].

An effective preventive measure for reducing childhood smoking is by implementing package warnings with graphic pictures and strong anti-smoking advertisements [300]. Evidence from Canada, Brazil and Singapore has shown that package warnings in the form of pictures increases the knowledge of the harmful health effects of smoking [300]. According to the WHO recommendations, at least 50% of the back and front package should feature a warning message. Cigarette packages in Kuwait carry a health warning written in Arabic, however they do not feature graphic pictures or strong anti-smoking advertisements, and no legal implications are placed on violating cigarette packaging regulations [299, 300] .

It is important to note that many smokers, particularly young people, may lack the knowledge of the health consequences caused by tobacco smoking. In a study in China, approximately 60% and 70% of smokers did not know that smoking causes cardiovascular disease and stroke, respectively [300]. Furthermore, there is evidence that most current

smokers that are aware of the health risks of tobacco use want to quit smoking [300]. Hence, there is a need to provide smoking cessation services at a national level. One example of a country that has implemented smoking cessation services that provide counselling and medication for all free of charge at a national level is the UK [298].

Healthcare professionals have a crucial role in implementing effective smoking cessation programmes. Particularly in Arab culture, medical professionals such as doctors and nurses are respected and are viewed as role models [4, 301]. In a Cochrane Review on smoking cessation programmes, intensive advice delivered by physicians increased the chances of smoking cessation by 84% [302]. Moreover, even brief physician advice on smoking was found to increase the chances of smoking cessation by 66%, while nursing staff interventions were found to increase the chances by 39% [302].

A particular method of smoking cessation that has proven to be effective in clinical settings is what is referred to as the "5 A"s guidelines, these are : Ask (if a patient smokes), Advise (in a manner that is suitable for the smoker), Assess (how motivated the smoker wants to stop), Assist (patients to quit smoking), Arrange (for follow-ups with smoking cessation services) [303]. The 5A's guidelines have been found to be successful at an international level in increasing the success of smoking cessation [303].

C) Psychological Distress (priority 3):

General mental and psychological health was highlighted as a public health policy priority by the Kuwaiti Government in their Healthcare Legislative Plan, hence elevated risk of psychological distress (denoted by an abnormal SDQ score) was examined in detail. In this study, psychological distress was more of a problem in Jahra (22%) than in Kuwait City (13%).

Of particular concern was the high proportion of girls reporting psychological distress in both cities. Girls in Jahra reported the highest proportion of psychological distress (Jahra girls= 27%, Kuwait City girls= 14%).

Aspects of living in a city that were associated with elevated risk of psychological distress in Jahra included living in an area with crime, violence and vandalism (OR=1.95), and experiencing severe noise in their neighbourhood (OR=1.92).

Experiences of bullying and psychosomatic complaints increased the risk of psychological distress. Bullying was strongly associated with an increase in psychological distress in young people in both Kuwait City (OR= 1.87) and Jahra (OR= 1.92).

Psychosomatic symptoms (a lot of headaches, stomach aches or sickness in the past six months), were reported by a significantly larger proportion of students in Jahra compared to Kuwait City, at 21% and 12% accordingly. As with psychological distress, psychosomatic symptoms were approximately twofold higher in girls in Jahra compared to Kuwait City.

Low back pain was evaluated in depth due to the large proportion of students who reported suffering from it in both cities and for its known association with psychological distress and its presentation as a psychosomatic condition. In both cities, an elevated risk of psychological distress was independently associated with low back pain. An increase in one unit of the SDQ score (measuring an elevated risk of psychological problems) increased the risk of low back pain by 6% and 7%, in Jahra and Kuwait City, respectively. In Kuwait City, experiencing psychosomatic symptoms was independently associated with low back pain, where students who suffered from psychosomatic symptoms were 2.25 times more likely to report suffering from low back pain.

In Jahra, two other urban health indicators were also independently associated with low back pain: sex and living in an area with crime, violence and vandalism. Girls in Jahra were 91% more likely to report suffering from low back pain in the past month than boys. Additionally, youths in Jahra who reported living in an area with crime, violence and vandalism were 68% times more likely to report suffering from low back pain.

Mental Health and Psychological Distress in Kuwait, the Arab States and Europe:

This study reports significantly higher levels of psychological distress in Jahra than in Kuwait City, at 22% and 13% accordingly. Additionally, from an intra-city perspective, a larger proportion of girls in this study reported an elevated risk of psychological problems than boys in both cities. In comparison, the EURO-URHIS2 mean for elevated risk of psychological

problems was 20%, making it lower than the proportion reported in Jahra but higher than Kuwait City [282]. In terms of psychosomatic symptoms (a lot of headaches, stomach aches and sickness in the past 6 months), the proportion of students who reported them in Jahra (21%) and Kuwait City (12%) was higher than the EURO-URHIS2 mean of 10%. In light of the findings of this study, psychological distress could be considered an important public health issue, particularly in Jahra given the sex differences observed at an inter-city and intra-city level.

No previous studies in young people in the Kuwait or the Arab States were found, which evaluated mental health and psychological distress using methods such as the Strength and Difficulties Questionnaire scores. However, the most recent GSHS 2011 data from Kuwait has reported that girls suffered from more loneliness, sleep difficulties, and worrying than boys [188]. In our study, sex was independently associated with psychological distress in Jahra, with girls being 66% more likely to have an elevated risk of psychological problems than boys.

Environmental urban health indicators, such as living in an area with crime and violence and exposure to severe noise were also independently associated with an elevated risk of psychological distress in Jahra. One of the important observations in our study was that youths who were victims of bullying were more likely to have an elevated risk of psychological distress in both cities. Compared to the EURO-URHIS2 mean of 7%, the proportion of youths who reported being victims of bullying (at least twice in the past two months) was 28% and 20%, in Jahra and Kuwait City respectively [282]. The literature search has not yielded previous detailed studies in Kuwait or in the Arab States evaluating the concept of bullying in youths.

D) Low Back Pain:

One of the most striking findings from the analysis, concerned the experience of low back pain (in the past month) in both cities, which was considerably higher in both Kuwait City (64%) and Jahra (75%) than in Europe (42%). Low back pain was reported by significantly more girls rather than boys in Jahra (OR= 1.91), where approximately four out of five girls

reported suffering from low back pain in the past month. Also, significantly more girls in Jahra (82%) reported suffering from low back pain than girls in Kuwait City (64%).

We not only identified in this analysis a very high prevalence of low back pain symptoms in young people living in Kuwait City and Jahra but also the potential of the individual burden it represents to the sufferers in terms of psychological mental health (elevated risk of psychological distress) in both cities, and psychosomatic symptoms in Kuwait City. However, it is important to note the general study limitations of cross-sectional studies in terms of the temporality of relationships in these findings. This will be covered in Section 10.4.

Psychological distress and low back pain: a public health concern :

It is estimated that 20% of young people experience psychological disorders, with half beginning before the age of 14 years old [304]. The implications of not addressing mental health conditions could have a serious impact on young people's health and well-being, with them facing social isolation and stigma in the future [304] .

The findings of this research indicate that the possible drivers of psychological distress are in the social environment, particularly in the school setting. In light of the high prevalence of psychological distress and low back pain, it should be considered that the alarming differences between the two populations could be related to SES.

Low back pain has been linked with psychosocial factors and psychosomatic symptoms in young people in previous research [306]. The literature review has not found any previous studies in Kuwait at a country or city level as well as in the Arab States that examined low back pain in young adults or schoolchildren. Due to the alarmingly high prevalence of low back pain in both cities, and its potential connection to mental and psychological health, this indicator is of importance to public health policy in light of the current governmental focus on general psychological health in young people.

10.3 Strengths of this research:

This research study adopted validated tools and methods for collecting Urban Health Indicators (UHIs) data for young people (aged 14-16 years) living in cities from the EURO-URHIS2 project. The Arabic version of the youth survey questionnaire was developed to measure the seven health domains relevant to the health of young people living in cities. It was successfully administered in school settings in Jahra and Kuwait City and helped identify key health issues for young people living in these cities, potentially relevant across the Arab States. The validated tools also assessed health outcome measures (including urban health indicators in psychological distress, physical health, and low back pain) using standardised validated questions sourced from reliable tools [282].

Prior to this research, UHIs had only been assessed in 50 cities in Europe for the EURO-URHIS2 project [153]. Hence, this study has helped identify the utility of the tools and methods in urban contexts outside of Europe. In addition, these tools and methods have helped identify priority health issues that have not been studied in the past in Kuwait City and Jahra or in the Arab States region, helping inform local and regional policy by providing evidence for key public health objectives and also potential health issues not considered previously.

Some modifications were made to the survey questionnaire from the original European tool used in the EURO-URHIS2 project including questions related to smoking cigarettes. The term for “smoking cigarettes” in Arabic was replaced with the Arabic term for “smoking tobacco”. This was done after recommendations from the first and second stage of the piloting of this study. As described in Chapter 3.8, alternative cultural modalities of smoking tobacco are widespread in Kuwait and the Arab States (for example tobacco smoking using Shisha) and using a more inclusive terminology would provide a better representation for student smoking habits. Hence, using the term “cigarette smoking” would have raised the possibility of excluding tobacco smokers that use shisha (a prevalent use of tobacco in the Arab States) and underestimating the proportion of youths that ever smoked or currently smoke tobacco.

The choice of measuring height and weight objectively by the research team was made to get an accurate assessment of body mass index for young people in the survey. While other studies have relied on self-reported height and weight, there is evidence that these were found to be inaccurate, particularly in young people [253].

The acceptance rate of participating schools was very high in both cities. This is important to ensure the representativeness of the study sample. It is likely that the approach adopted in this regard, helped achieve this high participation rate. The decision to contact school principals directly (as gatekeepers) with a letter stating the importance of this research to Kuwait (as a country) and the city could have been beneficial and may have contributed to the high number of schools in both cities that agreed to participate in this research. It should be noted that the majority of schools in both cities are government schools and applying for ethical approval through the Ministry of Education (Kuwait) appears to have helped in the decisions of school principals to participate in the study. Only one school refused to participate from all the schools contacted in both cities.

The overall response rates were very high for both Kuwait City (89%) and Jahra (87%) and further reinforced the representativeness of the sampling (and minimising the potential for non-response bias). Previous school-based surveys in Kuwait have achieved response rates ranging from 65-98% [273]. Response rates were not as high in the European settings for the EURO-URHIS2 project [282].

10.4 Limitations of this research:

An important limitation that should be considered is the use of a European methodology and research tool such as the EURO-URHIS-2 project in an Arabic country like Kuwait. This should be taken into account given the different cultural, social, legal and environmental differences between the European youth populations and those in an Arabic setting. While the European tool is not ideal for this particular study population, the lack of alternative and standardised tools presented it as the most suitable option for assessing urban health indicators in Kuwaiti youths. Steps were taken by the research team to ensure that the

European tool could be used in young people in Kuwait, including validating the research tool and consulting with local public health experts in Kuwait and researchers in the EURO-URHIS-2 project prior to piloting the translating the questionnaire. Preliminary results from the youth data in Jahra and Kuwait City were presented in the final EURO-URHIS-2 conference and this lead to the approval of including Kuwait as part of the EURO-URHIS-2 project. Nevertheless, the data obtained from this research should be evaluated cautiously and the EURO-URHIS-2 project methodology and UHI need to be assessed in other youth populations outside a European setting.

One of the limitations placed by the Ministry of Education (Kuwait) Ethics Committee was the refusal to allow inclusion of questions in the EURO-URHIS2 on sexual activities and alcohol use. The Ethics Committee based their decision on the cultural and social sensitivity of these topics in traditional Arabic societies. Hence, the decision was made by the research team to omit the questions included in translated Arabic version of the EURO-URHIS2 questionnaire on sexual activities and alcohol use. Due to this omission however, the opportunity was missed to provide insight in these two youth urban health indicators.

Previous health researchers in the Arab States have faced similar difficulties in trying to assess sexual activities and alcohol use in children due to cultural and social factors [4]. Indeed, little is known about sexual practices and alcohol use in young people in Kuwait and the region, even in Arab countries where alcohol is readily available. Sales of alcohol are prohibited by law to Kuwaiti citizens [182]. However, the grey literature suggests that alcohol use is growing in young adults in Kuwait [307]. Despite the evidence in studies conducted on adults in the Arab States that suggests that alcohol use is low compared to the rest of the world, the inability to assess this in young people in Kuwait City and Jahra was a missed opportunity in this research [4].

Interestingly, while the Ministry of Education requested the removal of questions on sexual practices and alcohol use, they have permitted questions on cannabis use, despite its serious legal implications in the State of Kuwait. Previous studies conducted by the Ministry of Health have also not faced ethical issues when examining drug use in school settings. Cultural and religious factors could play a part in this, where sexual practices and alcohol

have important cultural and religious taboo in Kuwaiti and Arabic society, while cannabis use is less likely to be attached to this stigma [4] .

As previously mentioned, one of the key UHIs for the current study, and of interest to the Kuwaiti Government, is cannabis use in young people. In Kuwait such drug use carries severe legal consequences. The Kuwaiti penal law on illicit drugs use does not classify substances based on categories and/or severity as in countries like the UK [258]. Hence, from a legal perspective, the use of cannabis can carry the same prison sentence (a maximum of 2 years) as the use of heroin. Despite efforts taken in this research to inform students of the anonymity of their data, both verbally at the start of the survey and in written form within the questionnaire, the considerable legal implications of admitting drug use have to be considered. Therefore, estimates of cannabis use based on the self-reported data in our study are likely to be underestimates given these considerations. The same considerations also apply to cigarette smoking, which is illegal in Kuwait under the age of 21, with financial penalties placed on the youth's parents or legal guardians. This might also impact on underestimates of its prevalence based on self-reported data. By contrast cigarette smoking has cultural associations in the Arab States with masculinity [4]. Other forms of tobacco smoking modalities, such as shisha smoking appear to not share the same cultural and social taboo for girls [4]. Efforts were made in this research to allow privacy during completion of the survey by separating desks, whenever possible, to reduce the chance of students comparing answers and influencing each other, particularly in sensitive questions such as smoking. Nevertheless, the consideration of girls' under-reporting smoking should be considered in light of its social and cultural taboo in the Arab States.

It is important to mention a general limitation of cross-sectional analysis, that they only provide data at a given time point rather than investigating the data and findings longitudinally. While surveys can provide estimates of the prevalence of urban health indicators, they cannot provide a clear picture when assessing how factors are associated with health outcomes and burdens as the temporality of relationships are not known [308]. One such example in our study is in the case of low back pain and its significant association with psychological distress, where the temporality of relationships is not known due to the cross-sectional nature of the study. Similarly, this should be also considered when

interpreting the significant association in our study between tobacco smoking and psychological distress.

As multiple statistical testing was performed in this research, implications of this have to be considered, particularly with regards to the increase chance of type 1 errors. However, steps have been taken to adjust for this using the advice and methodology provided by a statistician and applying the Bonferroni correction, as mentioned in Chapter 6.7.3. It is worth noting that while the Bonferroni correction was using in this research, it remains a conservative approach for reducing type 1 errors.

Bedoon "Stateless" in Jahra

The situation of the stateless individuals (Bedoon) in Jahra was covered in detail in Chapter 4.4.2 of this research. Estimates place the number of Bedoon living in Jahra to be approximately one-fourth to one-fifth of the population of the city, with the majority living in the Taima district [194]. The government of Kuwait officially classifies Bedoon as illegal immigrants.

Since 2010, Bedoon students have been allowed to attend governmental schools free of charge [194]. While Kuwaiti and other nationalities are required to attend governmental schools based on the district they live in, this law does not apply to Bedoon students [194]. Therefore, while most Bedoon youths live in the Taima district, it is possible that they are studying in schools in other districts or even outside the boundaries of Jahra city.

As stateless individuals, the limited demographic data suggests that Bedoon face complex economic and social barriers compared to the rest of the population [240]. Due to the political sensitivity of their situation, research on Bedoon is extremely limited. While care was taken in this research to randomly select a school from every district in Jahra from the sampling frame, the Ministry of Education ethics committee advised against asking students if they were Bedoon or not. Although the questionnaire used in this research included information on where the student was born, this has little relevance as most Bedoon aged 14-16 are born in Kuwait [194]. Hence, there was no method to identify which respondents were Bedoon given the political barriers present in Kuwait. While discussing this topic with other

members of the research team, the consensus was that Bedoon formed 1 in 4 of the students in Jahra.

In light of the political nature of this topic and the barriers placed on exploring it in this study, one has to consider the possibility of urban health indicator differences between the Kuwaiti population of Jahra and the Bedoon population. As Bedoon form a sizable proportion of the population of Jahra city, it is important to note this limitation in the assessment of the data presented in this research. Hence, the study sample in Jahra from our current analysis might not have represented the Bedoon, which could have unique health issues that need to be considered when understanding the health of the two cities and the impact of governmental public health policy.

11: Conclusion and Recommendations

11.1 Presenting a framework for future quantitative public health research in young people in Kuwait

The findings of this study present a better understanding of the public health situation and the main urban health issues that face young people in a highly urbanised country like Kuwait through its two largest cities, Kuwait City and Jahra. It has also presented a novel attempt to assess urban health indicators at an intercity level between young people in Kuwait City and Jahra. There is a dearth of epidemiological research with respect to urban health in youths and the findings of this study could provide a baseline for future public health research in Kuwait and the region. The Department of Public Health in the State of Kuwait has requested more information to help inform policy in assessing the ongoing Kuwait Healthcare Legislative Plan focusing on overweight/obesity, tobacco smoking and cannabis use, and general mental and psychological health in young people.

As the findings of this research are from a cross-sectional study, there is a need to apply similar cross-sectional studies in the near future in Kuwait City and Jahra (as well as other cities in Kuwait) to observe trends in key urban health indicators and provide comparisons for policy makers. The public health concerns observed in this study, such as the high prevalence of overweight and obesity and the widespread prevalence of psychological distress and low back pain, need to be assessed in other major cities in Kuwait and cities within the Arab States. Future studies will also benefit from investigating intra-city differences between the Kuwaiti and Bedoon population of Jahra if the current political climate changes.

The Arabic version of the EURO-URHIS2, with minor cultural modifications to better suit the populations in Kuwait City and Jahra, has been successful in providing crucial urban health indicator knowledge for intercity and intracity comparisons. Using the methodology of this research and this validated tool can help improve the understanding of urban public issues

in young people in the region (as Arabic is a shared language), to see if other young people in Arab States cities are facing similar public health issues.

Based on the findings of this research, it is important to understand why youth urban health status differences exist between students of Jahra and Kuwait City. There is evidence to suggest from these findings that the youth population in Jahra faces more health and gender inequality than Kuwait City. The arguments presented in the limited studies in Jahra presenting it as a less affluent and/or deprived area need to be addressed and investigated further in light of the findings of this analysis. Our study has provided evidence that students in Jahra, especially girls, face poorer health in many key urban health indicators compared to Kuwait City and Europe. Hence, there is a need for both a gender and equity focused assessment of public health in Kuwait, in light of the findings of this study.

11.2 The need to address overweight and obesity as a major public health concern for young people in Kuwait:

Approximately 3 out of 5 young people in this research were overweight or obese in Kuwait City and Jahra. Furthermore, approximately 30% of young people in both cities were obese. These figures place Kuwait City and Jahra with one the highest prevalence rates of overweight and obesity recorded in the region. While the Government of Kuwait has placed overweight and obesity in youths as one of its primary foci in its current Healthcare Legislative Plan, it has not outlined a clear strategy to tackle this public health issue. The results from this research place this urban health indicator as a major public health policy issue that needs to be urgently addressed.

The WHO recommends that policies to tackle obesity in young people require a “whole-of-government” approach [285] . The involvement of central government policy makers, local authorities, medical professionals and the community is crucial for understanding and providing solutions for the overweight and obesity issue in Kuwait [284]. Within the European Union, a regional action entitled “European Union Action plan on childhood obesity” has been implemented to address this public health issue [285]. At the time of writing, no regional efforts within the Arab States or in the EMRO region (which Kuwait is a part of) exist to

address childhood obesity. From the results of this study and others in the region, there is a need to address dietary habits and lack of physical activity as important drivers for the alarming prevalence rates of overweight and obesity through public health policy in Kuwait.

With less than 10% of students in both cities achieving the WHO recommendation of 60 minutes of physical activity per day, there is a need to understand why most students do not engage in physical activity and to evaluate any potential barriers that prevent students in both cities from achieving this. The concept of providing a healthy "built environment" to promote physical activity should be high on the agenda of the Government of Kuwait [285] . As most schools are governmental in Kuwait, urban planning should be taken into account when building new schools, as well as assessing existing schools, in order to maximise the benefit of providing a safe and accessible environment for promoting physical activity. Currently, many schools in Kuwait lack the facilities to provide a safe and easy to access for children and young people to participate in physical activity. Governmental urban planning should also address access to fitness and recreational facilities, with providing the option of safe public transport to these services for young people from their homes and school.

The initiative to provide indoor gymnasiums and safe play areas for young people should be a viable option and achievable in a resource-rich country like Kuwait, given the extreme outdoor temperatures in summer periods. The Ministry of Health (Kuwait) has mentioned its concerns with physical inactivity in young people in governmental reports, although it has cited that the main obstacle was the extreme climate of the country (with temperatures reaching 50 degrees centigrade in summer months) [174]. Other access barriers to young people in Kuwait under the age of 18 to existing fitness areas (such as high costs and minimum age of entry) are well documented [174]. One approach to establishing safe and accessible indoor facilities for young people is to involve the community in each district or area of the city. Each district in Kuwait has a co-operative system that is owned by members of the public that live in the district, providing services and facilities to the residents with guidelines set by the local government. Public-owned property is provided to co-operatives by the Kuwaiti central government through a request from the local authorities to deliver services and supermarket facilities. Involvement of co-operatives in both cities to provide an indoor safe space for young people, that is close to their homes could in turn encourage

them to engage in more physical activity. This novel initiative could be tested in districts in both cities and with health outcomes assessed in future research.

Important policy recommendations should also be considered with regards to behavioural and lifestyle school-based interventions, including modifying the current Kuwaiti school curriculum. The current school curriculum in Kuwait, provided by the Ministry of Education, does not address issues of healthy eating habits or physical activity nor provide teaching material in these two important overweight and obesity drivers. Due to the importance and implications of childhood obesity, it is recommended that behavioural and lifestyle interventions on healthy eating habits and promoting physical activity in school-based settings should be introduced at a young age, particularly in the optimum age group of between 6-12 years old. Coordinated efforts should be made between the Ministry of Health and Ministry of Education in providing teachers with the skills and materials necessary to educate and encourage children in healthy eating habits and physical activity. The "school environment" should promote students to remain active whenever possible. Additionally, parental and community involvement should also be encouraged [285]. Also, within the school environment, there is a need to ban sales of unhealthy dietary products, such as fizzy drinks and other high-sugar beverages, while making water easily accessible to all students [285].

At the time of writing, a joint proposal from the Ministry of Health (Kuwait) and Ministry of Education is being reviewing by the Kuwait parliament to re-instate school meals in governmental schools in the State of Kuwait [281]. Prior to 1990, a school meal that included an equivalent of two portions of fruit and vegetable with a meat or plant-based protein was provided to all students free of charge in governmental schools [281]. While similar initiatives of introducing healthier school meals have been proposed in the Arab States, they have not been implemented [4]. Given the alarming rates of overweight and obesity recorded in young people in both cities in this study, the proposal of re-introducing school meals could prove beneficial, although it would require a clear long-term strategy and cooperation between the Ministry of Health and Ministry of Education.

There is a need for the Kuwaiti government to address the current dietary situation in young people. Findings from this study suggest that dietary habits in young people in both cities are changing from a traditional Mediterranean-like diet that was rich in fibre, fish and vegetables, into a more "Westernised" diet. In this study, only 1 in 3 students regularly ate fruits and less than half the students regularly ate vegetables and/or salads in both cities. Currently, nutritional health promotion programmes focusing on fruit and vegetable consumption, such as the 5-A-DAY in the UK, do not exist in Kuwait [310]. Implementing a nationwide public health programme to encourage parents and young people to eat more fruits and vegetables and to raise awareness of portion size could be beneficial in improving the current situation.

The absence of food labelling policies and other methods of improving nutrition literacy should be addressed by public health policy makers in Kuwait. At the time of writing, food labelling is not regulated by the government and no form of food labelling policy exists. Coordinated efforts involving other Arab States to implement regional policies for food labelling should also be considered. Existing models of food labelling in other countries should be assessed in order to find a simple and suitable method that is easily understood by both adults and young people. The selected food labelling strategy should also provide the basic nutritional knowledge (for example total calories, added sugar content, trans and saturated fats, and portion size) that will aid individuals to make healthier dietary choices [285].

An important area that needs to be reassessed in Kuwait is the role of the healthcare sector in the prevention and treatment of childhood and adolescent obesity, given the implications and economic burden this public health issue will present for the country in the future. As with governmental policies, the main focus of the healthcare services should be on reducing population BMI rather than focusing on those that are overweight and obese. Primary prevention for childhood obesity should be delivered preconception and during pregnancy, through qualified healthcare professionals, with a focus on encouraging future mothers on the importance of healthy dietary habits and ideal body weight, as well as promoting breastfeeding. Culturally influenced dietary habits should be addressed through means that are socially acceptable for the mother in order to bring about positive behavioural changes. Due to the alarming prevalence of childhood obesity in the country, there is a need for the

heath sector to urgently review existing guidelines in treating childhood and adolescent obesity. The recent NICE guidelines on “Weight management: lifestyle services for overweight and obese children and young people” could be considered for review and modified according to the local situation in Kuwait, and possibly within the wider context of the Arab States.

11.3 Improving Efforts in tackling tobacco smoking:

In this research, almost half the boys in Jahra and Kuwait City have tried smoking tobacco in the past. The Kuwaiti government has passed its Smoking Cessation Legislation in 1995, prohibiting smoking in public places and increasing the legal age of smoking all forms of tobacco from 18 to 21 [255]. Despite recent smoke-free laws in Kuwait being implemented in schools and educational institutions, they have failed to cover most public spaces, including governmental facilities, indoor offices, shopping centres, and restaurants and cafes [297]. Fines and penalties exist for smoking in public places through the current Kuwaiti smoking legislation, however there appears to be a lack of political will to implement these measures. The Kuwaiti parliament has recently discussed the failure of the Kuwaiti government in implementing this law [256]. In a recent study, more than 50% of youths aged 13-15 were able to purchase cigarettes from a supermarket or convenience store [179]. There is a need by government officials in the Ministry of Health and Ministry of Interior to review this law and the barriers that exist in implementing it.

The WHO has recognised the importance of monitoring and preventing tobacco use as one of its main goals through the WHO Tobacco Free Initiative (TFI) [298]. Through the TFI, the WHO developed the MPOWER tool, to assist country’s in implementing effective measures to tackle tobacco use and provide country comparisons [299]. The MPOWER measures are as follows : Monitoring, P (smoke-free policies), O (cessation programmes), W (health warnings and mass media), E (advertising), and R (taxation) [297]. While Kuwait has performed well in terms of monitoring tobacco use in adults and children at a country level, it has limitations in several key issues that have been successful in other countries, particularly in smoke-free policies, mass media anti-smoking campaigns, smoking cessation programmes and tobacco pricing and taxation [297]. Due to the recognised health risks of second-hand smoking, it is

advised to target the whole population with regards to preventing tobacco use (with upstream and midstream preventive measures), instead of focusing on only those at risk.

An important recommendation that could be made at this stage is to review the current price of tobacco products in Kuwait with the aim of increasing prices through governmental taxation as a primary prevention measure for young people to not start smoking tobacco. At present, the average price of tobacco products in Kuwait is considerably lower than the average prices in developed countries [256]. Efforts in the UK with tobacco taxation have been successful [311]. From a theoretical perspective, increasing the price of tobacco products in Kuwait could in turn reduce the chance of youths ever smoking.

Several other "upstream" measures could also be considered by the Kuwaiti government and policy makers, for example national anti-smoking advertisements. According to the WHO, between 2014 and 2016 there were no national mass media anti-tobacco campaigns in Kuwait [297]. Evidence from the grey literature suggests that this has been the case for the past decade. Mass media advertising campaigns have been effective at an international level in preventing young people from smoking and encouraging smokers to quit. While Kuwait has recently banned the advertising of tobacco products on national television and radio stations, privately owned television and radio stations are not covered by this advertising ban [297] . This is another area that requires urgent involvement from governmental agencies to implement the current legislation on all forms on media. Within an Arabic setting, Egypt and Jordan have successfully implemented advertising and sponsorship of tobacco use to include public and private media outlets. With the growing use of social media, particularly in young people, steps have to be taken to ensure that this form of media is taken into consideration both in terms of its benefits and its impact on smoking status in young people.

While efforts have been made by the Government of Kuwait to comply with the recommendations of the WHO in terms of using the front and back packages of tobacco products by displaying health warnings, they do not carry any graphical images. As previously discussed, graphical images have been an effective measure to prevent young people from tobacco use and encourage smokers to consider quitting. It is therefore recommended that this particular issue to be reassessed by policy makers.

Despite the importance of “upstream” measures in tobacco prevention, the effective and proven “downstream” interventions, such as smoking cessation programmes, should be carefully assessed by policy makers in Kuwait, particularly within the Ministry of Health. There are important limitations in the current smoking cessation programmes in Kuwait and the role of physicians and nursing staff needs to be reassessed. As in the UK, point of entry to the Kuwaiti healthcare system is through the primary care clinics. While medical treatments for smoking cessation are offered free of charge at primary care clinics, there are no guidelines or protocols in place to assess and help smokers quit, whether in young people or adults. As previously discussed, internationally recognised approaches such as the 5As (Ask, Advise, Assess, Assist and Arrange) have been proven to be beneficial and effective in smoking cessation programmes. Given the current load on healthcare services in Kuwait, particularly at the level of primary care, it would be acceptable to implement the 3As protocol (Ask, Advise and Act) [303]. The 3As approach has been proven to be effective, and even limited advice can increase the chances of quitting smoking by 1-3% in the primary care clinic [303] . This protocol should be implemented on all patient’s visiting their physician in a primary care setting in Kuwait.

When implementing the 3As approach in Kuwait by physicians, special training is required in the form of the advice given to smokers, particularly in young people. There is evidence that young people who smoke are more likely to visit their doctor than non-smokers, whether for medical or psychological reasons [301] . In order for the advice given to young smokers to be effective, the message and language used should take into account the patient’s gender, culture and social circumstances. As previously mentioned, also of consideration in an Arabic setting is tobacco use through other modalities, such as shisha smoking, which should be evaluated through the 3As protocol.

A final comment worth noting in current smoking cessation programmes in Kuwait is that medical treatments that can be effective and administered to young people, such as nicotine replacement therapy, require the approval of the child’s parent or legal guardian if they are under the age of 18. This might discourage young people to seek medical treatment and discuss smoking cessation if their parents are not aware of their smoking habits. Hence, it would be recommended that smoking cessation programmes in Kuwait should be

reassessed to offer young people these effective treatment modalities free of charge and in an anonymous manner.

11.4 Policies aimed at addressing psychological distress:

As youths in Kuwait City and Jahra have not been assessed in previous research with regards to their general mental health and elevated risk of psychological distress, there is a need for further studies to examine the inter-city and gender differences reported in our study. Despite mental health for young people in urban settings being a focus of the current healthcare policy in Kuwait, the government has not outlined a particular spectrum or dimension within mental health for its policy. From the findings of this research, there appears to be a concern that the differences between the two cities could be related to the differences in SES between the two populations. This raises the possibility that students might be aware of the economic and health inequalities between the two cities and this in turn could impact their mental and psychological health.

The high proportion of young people who reported suffering from low back pain from both cities in this study is a worrying observation. Low back pain was independently associated with an elevated risk of psychological distress in both cities. Additionally, girls were more likely to suffer from back pain in Jahra than boys. These important findings require further attention in future research, particularly due to the known link between low back pain in young people and psychological health and psychosomatic symptoms [306]. Due to the widespread prevalence of low back pain, the role of the health sector, through its mental and psychological services, is to assess any young people presenting with low back pain as a possible psychosomatic symptom that requires further psychological evaluation. As general psychological health in young people was placed as a central public health issue by the Government of Kuwait, it is crucial to evaluate low back pain in future public health research.

One important recommendation that could be made to address psychological distress is in its association in this study with school environmental in both cities. There appears to be evidence that school-based interventions play an important role in preventing and addressing issues with mental and psychological health in young people. Efforts in other populations have been successful with mental health interventions in school-based settings,

especially when addressing depression and anxiety in young people [305]. One successful example that could be applied in schools in Kuwait is through group-based cognitive behavioural therapy [305]. Group-based interventions could shed some light to understand and possibly tackle issues that have been highlighted in this research, for example school-based bullying. Bullying in a school environment has not been examined in the Arab States and given the high prevalence of bullying in both cities (particularly in girls) more should be done by the Ministry of Education to assess and address this phenomenon. A measure to tackle this could be by introducing school-based interventions incorporated into curriculum of government schools to not only address bullying, but also methods of coping with psychological distress.

Policy makers should also consider the role of psychosocial community-based interventions in Kuwait to address mental and psychological health in young people. Evidence has shown that community-based interventions, including encouraging young people to participate in extracurricular and social activities, are effective in improving self-confidence, behavioural changes, and even bring about improvements in physical activity [305] . Additionally, community-based interventions should attempt to include parents and other family members.

One possible recommendation that could be made in light of the risk of psychological health presented in Kuwait, is that there is a need to provide a national help-line to assist young people in an anonymous and supportive manner. The role of social media could be considered in this approach. As elevated risk of psychological distress can be associated with suicidal thoughts and ideation, a national help-line could provide help for young people that have access barriers to mental and social services.

11.5 The need to re-assess the delivery of healthcare to young people in Kuwait:

The State of Kuwait has a national healthcare service modelled on the National Health Service (NHS) in the UK, providing free healthcare to all citizens with the point of entry at primary care level [247]. Youths over the age of 12 are treated as adult patients, despite their

legal status as children [244]. In addition, youths under the age of 18 are required to inform their parent or legal guardian if they are receiving treatment for conditions associated with smoking and/or mental health. This situation can create potential barriers preventing or delaying young people from seeking medical, psychological and social care.

With the high prevalence of poor health outcomes in young people living in Kuwait City and Jahra, introducing transition health and social care for young people aged 13-18 as part of the Kuwaiti national healthcare service could provide benefits to the delivery of healthcare for this age group. Medical professionals providing transition health care could receive training based on the specific urban health issues for each city based on public health policy priorities. This step in turn could help reduce the health and gender inequalities observed in this research.

11.6 The need to review the current Kuwait Healthcare Legislative Plan:

The current Kuwait Healthcare Legislative Plan has placed a central focus on the health of young people in three topics: overweight/obesity, tobacco smoking and substance abuse, and general psychological wellbeing [246]. However, it has not provided a methodology or detailed framework to tackle these urban public health challenges.

The findings of this research have presented clear evidence that the youth populations of Jahra and Kuwait City have different urban health needs and health risks that could result in health and gender inequalities in their respective youth populations if they are not addressed through public health policy. With the current and ongoing Healthcare Legislative Plan being revised in 2019, there is a need to address the main findings observed in this research by policy makers in order to set a clear and detailed framework for public health issues in each city. The evidence provided from this study presents a strong argument that the youth populations of these two cities have different public health needs and a single unified nationwide approach might not be the best option for public health policy. It is appropriate to consider the concept of “proportionate universalism” in the State of Kuwait, where public health policy is universal, but the delivery of these services is dependent on the degree they are needed [312]. However, it is important to note that national or targeted policies should not widened health inequalities. Recommendations could be made by

allowing local health authorities in each city more autonomy in tackling urban health issues based on their respective populations.

While cannabis use was placed as a main focus in the current and ongoing Healthcare Legislative Plan, the findings of this study suggest that there might be more pressing public health issues that require urgent governmental attention. From our findings, other urban health indicators, such as low back pain and inadequate oral health, appeared to be more prominent issues that need addressing in future Healthcare policy in Kuwait.

11.7 Recommendations for a collective effort in the Arab States to address the needs of young people in the region:

The urban populations of the Arab States share similar social and cultural characteristics that could collectively influence the health of young people living in the region. The findings presented in this study in Kuwait City and Jahra cannot be assessed in isolation of the distinct issues that youth populations experience in other parts of the Arab States.

Efforts within the Arab States to tackle youth urban health issues, such as in physical inactivity and obesity, have been proposed by governing bodies such as the Arab League and the GCC, but these have fallen short of expectations with limited outcomes [4]. Due to the politically unstable nature of the region, it is crucial to co-ordinate any efforts between countries of the region in future public health policy. The alarming findings of this research, particularly in overweight and obesity and psychological distress, should in turn be used to encourage other cities within the region to understand their youth urban health needs for comparisons and evaluating future trends. Future public health policies focusing on young people could be specifically tailored for the health needs of the region in order to reduce health and gender inequalities while respecting its unique cultural and social factors. To improve the urban health profile of young people in the Arab States, there is a need to shift focus in the region from curative medicine and country level mortality and morbidity trends to better understanding urban health indicators that could be unique to each city in the same country, as observed in our research between Kuwait City and Jahra. Policy makers in the Arab States should consider inter-city and intra-city differences and address the social

determinants of health in order to develop future public health policies through an equity lens.

Research Recommendations:

- One of the interesting observations in this research was that boys were significantly more likely to be obese than girls in both cities. While this has not been observed in previous epidemiological research in Kuwait and the Arab States, it is important to note that with the limited research available it is difficult to understand the factors behind this association. This finding requires future research and assessment to understand if it is unique to these two cities or if it can be observed in similar cities in the Arab States.
- More research is required in understanding why girls in both cities were less likely to engage in physical activity than boys in both Jahra and Kuwait City, Kuwait.
- Evaluation of low back pain should be considered a research priority both in Kuwait and within the wider context of the Arab States, given its high prevalence in this research and its known presentation as a psychosomatic symptom.
- The findings of this research have presented numerous dietary habits that require further assessment. More research is needed to understand fruit and vegetable consumption.

Lessons Learnt:

Prior to this research, my experience in the field of public health and medicine has been limited to working in a clinical setting or in a hospital. Conducting a large cross-sectional survey such as the one in this research was a difficult task that was only made possible through the help and support I have received both at the University of Liverpool (through my supervisors and other members of the staff at the Department of Public Health and Policy) and at the Department of Public Health in Kuwait.

I have learnt that leadership is crucial in public health research. Much of the help and support in conducting this research could not have been possible without the guidance of Dr. Jaafar Dawood, the Head of the Department of Public Health in Kuwait. In addition to him providing the expert opinion through the local public health expert panel, his experience has helped shape the overall success of this research. Arranging the expert panel to review and assess the EURO-URHIS2 youth questionnaire was a crucial part of this research, and without his efforts it would not have been possible.

The skills required to interact with young people are different than those needed when dealing with adults. We were lucky to have two senior health inspectors, Mr Basem Awkal and Ms Michelle Asaad, who have worked in previous school-based surveys, including the Global Health-Based Student Health survey. During the early stages of conducting the survey, their guidance and expertise helped overcome the initial difficulties in school settings. While I had to be available in every school (as requested by the Ministry of Education Ethics Committee) the health inspectors ensured that height and weight measurements were taken and distributed the questionnaires to the students. The health inspectors also helped in coding and making sure that the questionnaires were complete after each school.

One of the issues that might have been overlooked and could be improved in the future is that students were eager to learn more about their weight and height measurements. Many students also registered their interest in the questionnaire and its importance, a point which we have not considered. If this was known prior, the research team could have taken this opportunity to give an interactive session to students instead of allocating a single class session more time could have been requested.

Conference Proceedings and Future Publications:

- Preliminary results presented in EURO-URHIS2 project final conference (Amsterdam 2012)
- Presented in Public Health Symposium in Kuwait (Department of Public Health – April 2018)
- Presented in Obesity Conference in Kuwait University (Kuwait –May 2018).
- Presented in the Gulf Conference in Public Health and Policy (Kuwait – May 2018)
- Future publications : Two potential publications on urban health profiles and low back pain (currently being discussed/worked on with supervisors).

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Appendix A:

Main topics, terms and phrases searched for the literature review, MeSH and Boolean Operators used (and, or).

No.	*Search phrase/topic/term*
1	Urbanisation (urbanization)
2	Urban health (urban health indicators)
3	Urban setting/cities
4	EURO-URHIS (EURO-URHIS2)
5	Arab States/Arab countries/Arab States
6	Kuwait (State of Kuwait)
7	Young people/youths/adolescents/schoolchildren/girls/boys/teenagers
8	Childhood obesity/overweight
9	Psychological distress (problems)
10	Cigarette smoking (Tobacco smoking)
11	Shisha (hooka)
12	Cannabis (hashish)
13	Kuwait City
14	Jahra (Al-Jahra)
15	Psychosomatic symptoms
16	GCC countries
17	EMRO (Eastern Mediterranean Regional Organisation)
18	Arab States
19	Arab League
20	Balanced diet
21	Physical activity (inactivity)
22	School-based survey (school survey)
23	(low) back pain
24	Bullying (bullying others)
25	Road Traffic Accidents
26	Television Watching (TV watching)
27	Oral Health (hygiene) /brushing teeth
28	Fruit/vegetable consumption
29	Ministry of Health (Kuwait)
30	Ministry of Education (Kuwait)
31	World Health Organisation (Organization) Programmes

Appendix B : Ethics Approval 1 : University of Liverpool (Faculty of Health and Life Sciences approval)

UNIVERSITY OF LIVERPOOL

Mrs Lindsay Carter
Research Coordinator
Legal, Risk & Compliance

Faculty Support Office
University of Liverpool
1st Floor
Duncan Building
Daulby Street
Liverpool
L69 3GA

Tel 0151 706 4523
Fax 0151 706 5668
Lindsay.Carter@liv.ac.uk

Faculty Ref: UoL000763

Wednesday 17 August 2011

Dr Daniel Pope (Fayez Al-Zarban)
Institute of Psychology, Health and Society

Dear Dr Pope

I am pleased to confirm that your research study 'Indicators of Urban Health in the youth population of Kuwait City and Jahra, Kuwait' has received formal Faculty approval and that having consulted with the insurance broker, I can also confirm that the University professional indemnity and clinical trials insurances will apply to the project as appropriate.

(Please note that this does not constitute University ethical approval)

With regards

PP R Turner

Mrs L Carter
Research Co-ordinator
Faculty of Health and Life Sciences Support Office

Appendix B : Ethics Approval 2 : Ministry of Education (Kuwait) ethical approval for Jahra schools (Arabic)

75 / 30 / EA0085698/05/5000

MINISTRY OF EDUCATION
Educational Research and
Curricula Sector
EDUCATIONAL RESEARCH & DEVELOPMENT ADMINISTRATION

وزارة التربية
قطاع البحوث التربوية والمناهج
إدارة البحوث والتطوير التربوي

الرقم : وت / 897
مرفقات /

التاريخ / / 14هـ
الموافق 11 / 12 / 2010 م

السيد المحترم/ أ. عبدالله الحربي

مدير عام منطقة الجهراء التعليمية

تحية طيبة وبعد ،،،

الموضوع/ تسهيل مهمة

يقوم الطالب/ **فايز محمد الذربان** المسجلة ببرنامج الدكتوراه في جامعة لفربول بالمملكة المتحدة بإجراء دراسة بعنوان **" مؤشرات الصحة في المناطق الحضرية عند الشباب في مدينة الكويت والجهراء "**

فيرجى تسهيل مهمة المذكور أعلاه بإجراء البحث الميداني من خلال تطبيق (استبانه) المختومة صفحاتها من إدارة البحوث والتطوير التربوي على طلبة الصف الحادي عشر (ثانوي) في جميع المدارس الثانوية التابعة لمنطقتكم التعليمية خلال الفصل الدراسي الحالي 2011 / 2012.

مع خالص الشكر والتقدير ،،،

مدير إدارة البحوث والتطوير التربوي بالإنابة

أ. سميحة شريدة الفرحان
مدير إدارة التقويم وضبط جودة التعليم

وزارة التربية
إدارة البحوث والتطوير التربوي

نسخه للملف
Aziza 2011

ص . ب : ١٦٢٢٢ القادسية – ٣٥٨٥٣ الكويت – تلفون : ٤٨٣٨٣٢١ – ٤٨٤٢٤٠٤ – فاكس : ٤٨٣٧٩٠٩ – ٤٨٤٢٤٠٤
P.O.Box :16222 - QADSIAH - 35853- KUWAIT- Tel. : 4842404 - 4838321 - Fax : 4837909 - 4842404

Appendix B : Ethics Approval 2 : Ministry of Education (Kuwait) ethical approval for Jahra schools (translated to English)

BURHAN TRANSLATION BUREAU
البرهان للترجمة
Tel.: 22491680 - 22461769 - Fax : 22491680 - 22461769 تلفون : ٢٢٤٩١٦٨٠ - ٢٢٤٦١٧٦٩ - فاكس : ٢٢٤٩١٦٨٠ - ٢٢٤٦١٧٦٩

Emblem of State of Kuwait
Ministry of Education
Educational Research and Curricula Sector
Educational Research & Development Administration

Ref.: 897
Attachments: Date: 11/12/2011

Dear **Mr. Abdullah AlHarbi** ***Respectful***
General Manager of Jahra Educational Area

Kindest Greetings,

Sub: Facilitating a Task

This is to kindly inform you that student/ **Fayez M Alzarban** , a Registered PhD candidate at University of Liverpool, the United Kingdom, is currently conducting a study titled, " **Indicators of Urban Health in Youths in Kuwait City and Jahra** " .

Therefore, the above-named person should be provided with all necessary assistance that helps facilitate his field research with a questionnaire, pages duly stamped after the Educational Research and Development Department. This research is only permitted to be conducted to the 11^{th} grade (secondary) students in all secondary schools located in your educational territory, during the current academic year **2011/2012**.

Thanks and regards,
Sincerely,

Acting Director of the Educational Research and Development Department
Mrs. Samiha Shuraidah Al-Shuraidah
Director of Education Quality Control & Quality Assurance Dept.

BURHAN TRANSLATION Certified Translation

الكويت - المرقاب - شارع الشهداء - عمارة الربيعة - الدور الأرضي - مكتب (٧) - بجانب مركز الامارات للصيرفة
Kuwait - Murqab - Shuhada Street - Rabia Bldg. - Ground Floor - Office (7) - Next to UAE Exchange Centre

Appendix B : Ethics Approval 3 : Ministry of Education (Kuwait) ethical approval for Kuwait City schools (Arabic)

75 / 30 / EA0085698/05/5000

MINISTRY OF EDUCATION
Educational Research and
Curricula Sector
EDUCATIONAL RESEARCH & DEVELOPMENT ADMINISTRATION

وزارة التربية
قطاع البحوث التربوية والمناهج
إدارة البحوث والتطوير التربوي

الرقم : وت / 898
مرفقات / .....

التاريخ / / 14هـ
الموافق 11 / 12 / 2011 م

السيدة المحترمة/ أ. رقية غلوم

مدير عام منطقة العاصمة التعليمية

تحية طيبة وبعد ،،،

الموضوع/ تسهيل مهمة

يقوم الطالب/ **فايز محمد الذربان** المسجلة ببرنامج الدكتوراه في جامعة لفربول بالمملكة المتحدة بإجراء دراسة بعنوان **" مؤشرات الصحة في المناطق الحضرية عند الشباب في مدينة الكويت والجهراء "**

فيرجى تسهيل مهمة المذكور أعلاه بإجراء البحث الميداني من خلال تطبيق (استبانه) المختومة صفحاتها من إدارة البحوث والتطوير التربوي على طلبة الصف الحادي عشر (ثانوي) في جميع المدارس الثانوية التابعة لمنطقتكم التعليمية خلال الفصل الدراسي الحالي 2011 / 2012.

مع خالص الشكر والتقدير ،،،

مدير إدارة البحوث والتطوير التربوي بالإنابة

أ. سميحة شريدة الشريدة
مدير إدارة التقويم وضبط جودة التعليم

وزارة التربية
إدارة البحوث والتطوير التربوي

نسخه للملف

Aziza 2011

ص . ب : ١٦٢٢٢ القادسية – ٣٥٨٥٣ الكويت – تلفون : ٤٨٣٨٣٢١ – ٤٨٤٢٤٠٤ – فاكس : ٤٨٣٧٩٠٩ – ٤٨٤٢٤٠٤
P.O.Box :16222 - QADSIAH - 35853- KUWAIT- Tel. : 4842404 - 4838321 - Fax : 4837909 - 4842404

Appendix B : Ethics Approval 3 : Ministry of Education (Kuwait) ethical approval for Kuwait City schools (translated to English)

BURHAN TRANSLATION BUREAU
البرهان للترجمة
Tel.: 22491680 - 22461769 - Fax : 22491680 - 22461769 تلفون : ٢٢٤٩١٦٨٠ - ٢٢٤٦١٧٦٩ - فاكس : ٢٢٤٩١٦٨٠ - ٢٢٤٦١٧٦٩

Emblem of State of Kuwait
Ministry of Education
Educational Research and Curricula Sector
Educational Research & Development Administration

Ref.: 898
Attachments: Date: 11/12/2011

Dear **Mrs. Raqiyah Ghloum,** ***Respectful***
General Manager of Kuwait City Educational Area

Kindest Greetings,

Sub: Facilitating a Task

This is to kindly inform you that student/ **Fayez M Alzarban** , a Registered PhD candidate at University of Liverpool, the United Kingdom, is currently conducting a study titled, " **Indicators of Urban Health in Youths in Kuwait City and Jahra** " .

Therefore, the above-named person should be provided with all necessary assistance that helps facilitate his field research with a questionnaire, pages duly stamped after the Educational Research and Development Department. This research is only permitted to be conducted to the 11^{th} grade (secondary) students in all secondary schools located in your educational territory, during the current academic year **2011/2012.**

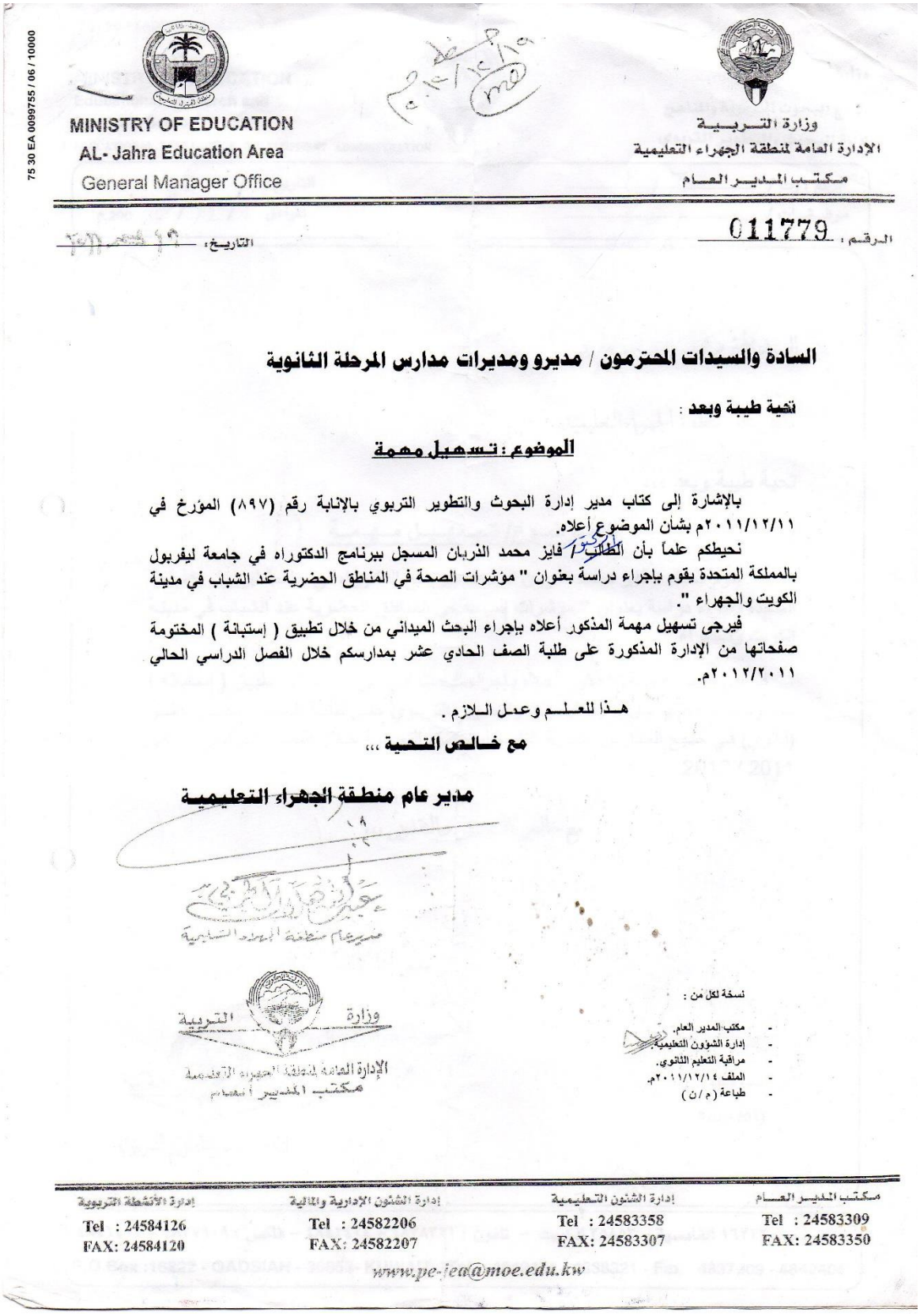
Thanks and regards,
Sincerely,

Acting Director of the Educational Research and Development Department
Mrs. Samiha Shuraidah Al-Shuraidah
Director of Education Quality Control & Quality Assurance Dept.

BURHAN TRANSLATION Certified Translation

الكويت - المرقاب - شارع الشهداء - عمارة الربيعة - الدور الأرضي - مكتب (٧) - بجانب مركز الامارات للصيرفة
Kuwait - Murqab - Shuhada Street - Rabia Bldg. - Ground Floor - Office (7) - Next to UAE Exchange Centre

Appendix B : Ethics Approval 4 : Jahra branch of Ministry of Education internal ethical approval for Jahra schools (Arabic)



75 30 EA 0099755 / 06 / 10000

MINISTRY OF EDUCATION
AL- Jahra Education Area
General Manager Office

وزارة التربية
الإدارة العامة لمنطقة الجهراء التعليمية
مكتب المدير العام

الرقم : 011779

التاريخ :

السادة والسيدات المحترمون / مديرو ومديرات مدارس المرحلة الثانوية

تحية طيبة وبعد :

الموضوع : تسهيل مهمة

بالإشارة إلى كتاب مدير إدارة البحوث والتطوير التربوي بالإنابة رقم (٨٩٧) المؤرخ في ٢٠١١/١٢/١١م بشأن الموضوع أعلاه.

نحيطكم علماً بأن الطالب / فايز محمد الذربان المسجل ببرنامج الدكتوراه في جامعة ليفربول بالمملكة المتحدة يقوم بإجراء دراسة بعنوان " مؤشرات الصحة في المناطق الحضرية عند الشباب في مدينة الكويت والجهراء ".

فيرجى تسهيل مهمة المذكور أعلاه بإجراء البحث الميداني من خلال تطبيق (إستبانة) المختومة صفحاتها من الإدارة المذكورة على طلبة الصف الحادي عشر بمدارسكم خلال الفصل الدراسي الحالي ٢٠١١/٢٠١٢م.

هذا للعلم وعمل اللازم .

مع خالص التحية ،،،

مدير عام منطقة الجهراء التعليمية

سيرغام سفانة المرزوق السبيعي

وزارة التربية
الإدارة العامة لمنطقة الجهراء التعليمية
مكتب المدير العام

نسخة لكل من :
- مكتب المدير العام.
- إدارة الشؤون التعليمية.
- مراقبة التعليم الثانوي.
- الملف ٢٠١١/١٢/١٤م.
- طباعة (م / ن)

مكتب المدير العام	إدارة الشئون التعليمية	إدارة الشئون الإدارية والمالية	إدارة الأنشطة التربوية
Tel : 24583309	Tel : 24583358	Tel : 24582206	Tel : 24584126
FAX: 24583350	FAX: 24583307	FAX: 24582207	FAX: 24584120

www.pe-jea@moe.edu.kw

Appendix B : Ethics Approval 4 : Jahra branch of Ministry of Education internal ethical approval (translated to English)

Emblem of State of Kuwait
Ministry of Education
Jahra Education Area
General Manager Office

Ref.: 011779

Dear Directors of the Secondary Schools, ***Respectful***

Kindest Greetings,

Sub: Facilitating a Task

Reference to the letter No. 897 dated 11/12/2011 from the Acting Director of the Educational Research and Development Dept.,

This is to kindly inform you that student/ **Fayez M Alzarban**, a Registered PhD candidate at University of Liverpool , the United Kingdom, is currently conducting a study titled, " **Indicators of Urban Health in Youths in Kuwait City and Jahra.**"

Therefore, the above-named person should be provided with all necessary assistance that helps facilitate his field research with a questionnaire, pages duly stamped after the aforementioned Department to be conducted exclusively to the 11th grade (secondary) students in your schools during the current semester **2011/2012.**

This is for your information and necessary action.

(signed and stamped)

Cc:

- GM office,
- Education Affairs Dept.
- Second Education Control
- Filing 14/12/2011
- Printing (م/ن)

Appendix B : Ethics Approval 5 : Kuwait City branch of Ministry of Education internal ethical approval for Kuwait City schools (Arabic)

State of Kuwait دولة الكويت

وزارة التربية

MINISTRY OF EDUCATION

المرجع: Ref. :

التاريخ: Date :

الإدارة العامة لمنطقة العاصمة التعليمية

قسم السكرتارية والسجل الصادر 18 DEC 2011 الرقم: ٢٨٧٤

السادة المحترمون / مديرو ومديرات مدارس المرحلة الثانوية.

(بنين - بنات)

تحية طيبة وبعد ،،،،

يرجى التكرم بتسهيل مهمة الطالب / **فايز محمد الذربان** المسجل ببرنامج الدكتوراه في جامعة لفربول بالمملكة المتحدة باجراء دراسة وهي حول " **مؤشرات الصحة في المناطق الحضرية عند الشباب في مدينة الكويت والجهراء** " وتتطلب هذه الدراسة **تطبيق استبانة** على طلبة **الصف الحادي عشر** وذلك خلال الفصل الدراسي الحالي ٢٠١٢/٢٠١١م .

شاكرين على حسن تعاونكم معنا ،،،،

مدير عام

الادارة العامة لمنطقة العاصمة التعليمية

وزارة التربية منطقة العاصمة التعليمية

نسخة لكل من :

- مدير عام المنطقة
- قسم التخطيط والمعلومات

P.O.Box 7 Safat - Code 13001 Kuwait ص.ب : ٧ الصفاة – الرمز البريدي ١٣٠٠١ الكويت

www.moe.edu.kw

Appendix B : Ethics Approval 5 : Kuwait City branch of Ministry of Education internal ethical approval (translated to English)

State of Kuwait

Ministry of Education

General Department of Kuwait City Educational Area

Ref.: 38740

Date: 18/12/2011

To: Directors of Secondary Schools (Boys & Girls)

Kind greetings,

Kindly provide **Fayez M Alzarban**, a registered PhD candidate at University of Liverpool, the United Kingdom, with the necessary assistance to help facilitate his research study titled, " **Indicators of Urban Health in Youths in Kuwait City and Jahra.**" This study require conducting a questionnaire on the 11th Grade (Secondary) in the current semester **2011/2012.**

Thanks and regards,

General Manager

General Department of the Capital's Educational Area

Stamped after

The general manager of the Kuwait City Educational Area.

Cc:

- GM of the educational area,
- Planning and Information Division

Appendix C : Data collection instrument (Arabic questionnaire)

شكرا لك لمساعدتنا في هذا الاستبيان!

بما أن معدل السكان مرتفع في المدن، وظروف المعيشة في المناطق الحضرية أصبحت مهمة جدا عند النظر في صحة السكان في العالم.

وستخضع إجاباتك لنظر الباحثين دون غيرهم. ولن يطلع عليها والداك أو أساتذتك. يجب عدم تدوين اسمك في الاستبيان. بعد ملء الاستبيان، يمكنك وضعه في المغلف المرفق وإغلاقه.

الأمور التي ينبغي أن تعرفها:

- بالنسبة لمعظم الأسئلة سيُطلب منك وضع علامة في المربع المطابق لإجابتك.
- يرجى وضع علامة في مربع واحد فقط لكل سؤال، أو جزء من السؤال، وإلا فإننا لن يمكننا اعتبار إجابتك. إذا كان من الصعب اختيار إجابة واحدة فقط، يرجى التفكير في ما هو صحيح في معظم الوقت.
- ليس عليك الرد على أي من الأسئلة إذا لم تكن ترغب في ذلك.

شكرًا لك مرة أخرى على مساعدتك.

وزارة التربية

إدارة البحوث والتطوير التربوي

نود أولاً أن نطرح عليك بعض الأسئلة عنك وعن منزلك.

1. ما هو جنسك؟ **يرجى وضع علامة في الخانة المناسبة**

ذكر	☐ 01
أنثى	☐ 02

2. في أي سنة دراسية أنت؟ **يرجى ذكر سنتك الدراسية**

عام _____

3. في أي شهر ولدت؟ **يرجى وضع دائرة حول الشهر المناسب.**

يناير فبراير مارس أبريل مايو يونيو يوليو أغسطس سبتمبر أكتوبر نوفمبر ديسمبر

4. في أي عام ولدت؟ **يرجى ذكر السنة.**

عام _____

5. في أي بلد ولدت؟ **يرجى ذكر إجابتك في المربع أدناه.**

ما هو موقع عنوان منزلك (مكان الإقامة الرئيسي)

اسم المنطقة _____

اسم المحافظة _____

6. كم سنة أقمت في هذا المنزل؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أقل من 5 سنوات	☐ 01
أكثر من 5 سنوات وأقل من 10 سنوات	☐ 02
أكثر من 10 سنوات	☐ 03

نود أن نبدأ بطرح بعض الأسئلة البسيطة عليك حول صحتك.

7. وبصفة عامة، هل برأيك صحتك...؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

ممتازة	☐ 01
جيدة جدًا	☐ 02
جيدة	☐ 03
متوسطة	☐ 04
سيئة	☐ 05

وزارة التربية

إدارة البحوث والتطوير التربوي

الأسئلة القليلة القادمة تتعلق بمشاكل في التنفس قد تكون واجهتك.

8. هل سبق لك أن عانيت من صفير في الصدر في الماضي؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01* **يرجى الانتقال إلى السؤال 9أ**
لا	☐ *02* **يرجى الانتقال إلى السؤال 10**

9أ. هل سبق أن عانيت من صفير في الصدر خلال الـ 12 شهرا الماضية؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01* **يرجى الانتقال إلى السؤال 9ب**
لا	☐ *02* **يرجى الانتقال إلى السؤال 10**

9ب. كم نوبة صفير واجهت خلال الـ 12 شهرا الماضية؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لم تحدث	☐ *01*
من 1 إلى 3	☐ *02*
من 4 إلى 12	☐ *03*
أكثر من 12	☐ *04*

9ج . في الأشهر الـ 12 الماضية، كم مرة في المعدل عانيت من الأرق بسبب الصفير؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لم أعاني من الصفير أبدًا في الصباح	☐ *01*
أقل من ليلة واحدة في الأسبوع	☐ *02*
ليلة واحدة أو أكثر في الأسبوع	☐ *03*

9د. في الأشهر الـ 12 الماضية، هل كان الصفير حادًا لدرجة أنه لم يكن يمكنك لفظ إلا كلمة أو كلمتين في وقت واحد بين كل تنفس وآخر؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01*
لا	☐ *02*

9ه. هل عانيت يومًا من الربو؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01*
لا ☐ *02*

9و. في الأشهر الـ 12 الماضية، هل بدا أن صدرك يصفر أثناء أو بعد ممارسة الرياضة؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01*
لا ☐ *02*

9ز. في الأشهر الـ 12 الماضية، هل عانيت من سعال (كحة) جاف ليلاً، غير السعال المرتبط بزكام أو التهاب في الصدر؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01*
لا ☐ *02*

9. ***إلتهاب الأنف***

تتناول جميع الأسئلة المشاكل التي تحدث عندما لا تعاني من زكام أو أنفلونزا.

10أ. هل سبق لك أن عانيت من مشكلة في العطس أو رشح أو انسداد الأنف دون زكام أو أنفلونزا؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01* **يرجى الانتقال إلى السؤال 10ب**
لا ☐ *02* **يرجى الانتقال إلى السؤال 10و**

10ب. في الأشهر الـ 12 الماضية، هل عانيت من مشكلة في العطس أو رشح أو انسداد الأنف دون زكام أو أنفلونزا؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01* **يرجى الانتقال إلى السؤال 10ج**
لا ☐ *02* **يرجى الانتقال إلى السؤال 10و**

10ج. في الأشهر الـ 12 الماضية، هل رافق مشكلة الأنف هذه حكاك وتدمع العينين؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01*
لا ☐ *02*

10د. في أي من الـ 12 شهرًا الماضية حدثت مشكلة الأنف هذه؟ **يرجى وضع علامة على كل المربعات المطابقة.**

يناير	☐	يوليو	☐
فبراير	☐	أغسطس	☐
مارس	☐	سبتمبر	☐
أبريل	☐	أكتوبر	☐
مايو	☐	نوفمبر	☐
يونيو	☐	ديسمبر	☐

10ه. في الأشهر الـ 12 الماضية، كم مرة أثرت مشكلة الأنف هذه على الأنشطة اليومية؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أبدًا	☐ *01*
بعض الشيء	☐ *02*
قليلا	☐ *03*
كثيرًا	☐ *04*

10و. هل عانيت مرة من حساسية الأنف؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01*
لا	☐ *02*

الأسئلة القليلة القادمة تتناول بعض المشاكل الجلدية قد تكون عانيت منها.

11أ. هل عانيت يومًا من طفح جلدي كان يظهر ويزول لمدة 6 أشهر على الأقل؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01* **يرجى الانتقال إلى السؤال 11ب**
لا	☐ *02* **يرجى الانتقال إلى السؤال 11و**

11ب.هل عانيت من هذا الطفح الجلدي خلال الـ 12 شهرًا الماضية؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01* **يرجى الانتقال إلى السؤال 11ج**
لا	☐ *02* **يرجى الانتقال إلى السؤال 11و**

11ج. وهل أثر هذا الطفح الجلدي المرفق بالحكة في أي وقت على أي من الأماكن التالية: الجزء الأمامي للمرفقين أو الجهة الخلفية للركبتين أو الجهة الأمامية للكاحلين أو الجهة السفلية للأرداف أو حول الرقبة أو الأذنين أو العينين؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01*
لا	☐ *02*

11د. هل اختفى هذا الطفح الجلدي تمامًا خلال الـ 12 شهرًا الماضية؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01*
لا	☐ *02*

11 ه - .في الأشهر الـ 12 الماضية، كم مرة في المعدّل عانيت من الأرق بسبب هذا الطفح الجلدي؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أبدًا في الأشهر الـ 12 الأخيرة	☐ *01*
أقل من ليلة واحدة في الأسبوع	☐ *02*
ليلة واحدة أو أكثر في الأسبوع	☐ *03*

11و. هل عانيت يومًا من الأكزيما؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ *01*
لا	☐ *02*

الآن نود أن نطرح عليك أسئلة عن حوادث أو إصابات قد تعرضت لها.

12أ. في الأشهر الـ 12 الماضية، هل تعرضت لأي نوع من الحوادث التالية التي أدت إلى إصابة (خارجية أو داخلية)؟ **يرجى وضع علامة في المربع المناسب لإجابتك لكل نوع من الحوادث. في حال وضعت علامة على (لا) لكل الحوادث، يرجى الانتقال إلى السؤال 13.**

	نعم	لا
حادث مرور		
حادث في المدرسة		
حادث منزلي وترفيهي		
	01	02

12ب. هل كان أي من هذه الحوادث متصلاً بالمشاركة في رياضة معينة؟ **يرجى وضع علامة على مربع واحد فقط.**

نعم ☐ 01
لا ☐ 02

12ج. هل قمت بزيارة طبيب أو ممرض أو قسم طوارئ في مستشفى نتيجة لهذا الحادث؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

حادث مرور

نعم، قمت بزيارة طبيب أو ممرض ☐ 01
نعم، ذهبت إلى قسم الطوارئ ☐ 02
لم تكن هناك حاجة إلى استشارة أو مداخلة ☐ 03
لا أعرف ☐ 04

حادث في المدرسة

نعم، قمت بزيارة طبيب أو ممرض ☐ 01
نعم، ذهبت إلى قسم الطوارئ ☐ 02
لم تكن هناك حاجة إلى استشارة أو مداخلة. ☐ 03
لا أعرف ☐ 04

حادث منزلي وترفيهي

نعم، قمت بزيارة طبيب أو ممرض ☐ 01
نعم، ذهبت إلى قسم الطوارئ ☐ 02
لم تكن هناك حاجة إلى استشارة أو مداخلة. ☐ 03
لا أعرف ☐ 04

الآن نود أن نطرح عليك بعض الأسئلة العامة حول طولك ووزنك.

13أ. كم يبلغ وزنك ؟ **يرجى كتابة الرقم في المكان المخصص.**

الوزن _____ كلغم

13ب. كم يبلغ طولك ؟ **يرجى كتابة الرقم في المكان المخصص.**

الطول _____ سم

وزارة التربية
إدارة البحوث والتطوير التربوي

السؤال التالي يتعلق بأي ألم في الظهر قد تكون عانيت منه.

14. في الشهر الماضي هل عانيت من ألم في الظهر استمر ليوم واحد أو أكثر؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	01 ☐
لا	02 ☐

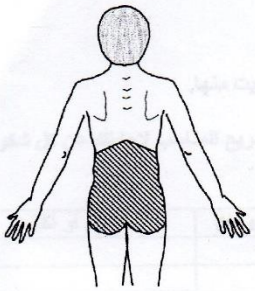


Fig. 1. Definition of low back pain according to pre-shaded manikin.

تتناول المجموعة التالية من الأسئلة مشاعرك ومواقفك تجاه الآخرين.

15. **لكل بند، يرجى وضع علامة في المربع (غير صحيح)، (صحيح إلى حد ما)، أو (صحيح بالتأكيد)، وذلك بوضع علامة في المربعات المطابقة لإجاباتك**. سيكون مساعدًا لنا إذا أجبت على كافة البنود. يرجى إعطاء إجاباتك على أساس كيف تسير الأمور بالنسبة لك. **خلال الأشهر الستة الماضية.**

		غير صحيح	نوعًا ما صحيح	بالتأكيد صحيح
أ.	أحاول أن أكون لطيفًا مع الآخرين. أهتم لمشاعرهم			
ب.	أنا كثير الحركة، لا يمكنني البقاء هادئًا لمدة طويلة			
ج.	أعاني كثيرًا من الصداع أو آلام في المعدة أو الغثيان			
د.	عادة ما أشارك مع الآخرين (الطعام والألعاب والأقلام وما إلى ذلك)			
هـ.	أنا سريع الغضب جدًا وكثيرًا ما أفقد أعصابي			
و.	أكون بمفردي عادة. وألعب عمومًا بمفردي أو أكون مع نفسي			
ز.	أنفذ عادة ما يُطلب مني			
ح.	أقلق كثيرًا			
ط.	أقدم المساعدة عند إصابة أحدهم أو شعوره بالسوء أو المرض			
ى.	أتململ أو أرتبك باستمرار			
ك.	لدي صديق طيب واحد أو أكثر			
ل.	أجادل كثيرًا. ويمكنني أن أجعل الآخرين يقومون بما أريد.			
م.	أستاء في أغلب الأحيان وأشعر بالاكتئاب أو الرغبة بالبكاء.			
ن.	بشكل عام أنا محبوب من أبناء جيلي.			
س.	أشرد بسهولة وأجد صعوبة في التركيز.			
ع.	أنا عصبي في المواقف الجديدة. وأفقد الثقة بسهولة.			
ف.	أعامل الأطفال الصغار معاملة جيدة.			
ص.	غالبًا ما يتهمونني بالكذب أو الغش			
ق.	يسخر مني الأطفال والشباب الآخرون أو يضايقونني.			
ر.	في أغلب الأحيان أتطوع لمساعدة الآخرين (الوالدين والمعلمين والأطفال).			
ش.	أفكر قبل القيام بالأمور.			
ت.	آخذ أشياء ليست لي من المنزل أو المدرسة أو مكان آخر			

خ .	اتفق بشكل أفضل مع البالغين أكثر من أبناء جيلي.			
ذ .	لدي مخاوف كثيرة، وأخاف بسهولة			
ض .	أنهي العمل الذي أقوم به. وتركيزي جيد.			
		01	02	03

نود الآن أن نطرح عليك بعض الأسئلة الإضافية حول شكاوى صحية أخرى قد عانيت منها.

16. هل عانيت من أي مما يلي في الشهر الماضي...؟ **يرجى وضع علامة في المربع المناسب لإجابتك عن كل شكوى صحية.**

	أبدًا	يوم أو يومان	3 أيام أو أكثر
صداع مزعج			
ألم في البطن			
ألم في الحنجرة			
	01	02	03

المجموعة التالية من الأسئلة تتعلق بنمط حياتك ونود أن نسألك عن نشاطاتك الجسدية.

17أ. ممارسة الرياضة هي أي نشاط يزيد من معدل نبضات القلب ويقطع نفسك لبعض الوقت. ويمكن ممارسة النشاط الجسدي في الرياضة والنشاطات المدرسية واللعب مع الأصدقاء أو الذهاب إلى المدرسة سيرًا على الأقدام. بعض الأمثلة على النشاط الجسدي تشمل المشي السريع، التزلج، ركوب الدراجة، الرقص، السباحة، كرة السلة وكرة القدم.

لهذا السؤال التالي، أضف كل الوقت الذي أمضيته في التمارين الرياضية كل يوم.

خلال الأسبوع الماضي، كم يوما قمت بالتمارين الرياضية لما مجموعه 60 دقيقة يوميًا على الأقل؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

- أبدًا ☐ 01
- يوم واحد ☐ 02
- يومان ☐ 03
- 3 أيام ☐ 04
- 4 أيام ☐ 05
- 5 أيام ☐ 06
- 6 أيام ☐ 07
- 7 أيام ☐ 08

17ب. خارج الساعات المدرسية: كم مرة تمارس الرياضة عادة في وقت فراغك لدرجة انقطاع النفس أو التعرق؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

- كل يوم ☐ 01
- 4 إلى 6 مرات في الأسبوع ☐ 02
- 2 إلى 3 مرات في الأسبوع ☐ 03
- مرة في الأسبوع ☐ 04
- مرة في الشهر ☐ 05
- أقل من مرة في الشهر ☐ 06
- أبدًا ☐ 07

وزارة التربية

إدارة البحوث والتطوير التربوي

17ج. خارج الساعات المدرسية: كم ساعة في الأسبوع تمارس الرياضة عادة في وقت فراغك لدرجة انقطاع التنفس أو التعرق؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لا أمارسها	☐ 01
حوالي نصف ساعة	☐ 02
حوالي ساعة واحدة	☐ 03
حوالي ساعتين إلى 3 ساعات	☐ 04
حوالي 4 إلى 6 ساعات	☐ 05
7 ساعات أو أكثر	☐ 06

الآن نود أن نطرح عليك بعض الأسئلة حول طعامك.

18. كم مرة تتناول الأطعمة التالية...؟ **يرجى وضع علامة في المربع الذي ينطبق على كل نوع من المواد الغذائية.**

	نادرًا أو أبدًا	مرة في الأسبوع	2-3 أيام أسبوع	في أغلب الأيام
أي وجبة لحم				
أي وجبة سمك				
أي منتجات حيوانية (على سبيل المثال جبن، حليب)				
أغذية البروتين النباتي (مثل الصويا والبقول)				
الخبز الأسمر				
رقائق البطاطس (فرينتش فرايز) أو البطاطس المشوية				
الحبوب المغلفة بالسكر(الكورن فليكس وغيرها)				
الحبوب الغنية بالألياف أو الشوفان				
الفاكهة الطازجة				
السلطات				
الخضار				
المشروبات ذات السعرات الحرارية المنخفضة (مثل الدايت كولا)				
المشروبات الغازية (مثل الكولا وغيرها)				
الرقائق المقلية (تشبس)				
الحلويات والشوكولاته				
	01	02	03	04

نود الآن أن نطرح عليك بعض الأسئلة الأخرى العامة حول نمط حياتك.

19. كم مرة تنظف أسنانك بالفرشاة؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أكثر من مرة في اليوم	☐ 01
مرة في اليوم	☐ 02
على الأقل مرة في الأسبوع لكن ليس كل يوم	☐ 03
أقل من مرة في الأسبوع	☐ 04
أبدًا	☐ 05

20. في الوقت الحاضر هل تتبع نظامًا غذائيًا أو تتبع نظامًا آخر لإنقاص الوزن؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لا، وزني جيد	☐ 01
لا، ولكن أود أن أفقد بعض الوزن	☐ 02
لا، لأنني بحاجة إلى زيادة الوزن	☐ 03
نعم	☐ 04

21أ. في يوم دراسي عادي، كم من الوقت قضيت في مشاهدة التلفزيون؟ **يرجى كتابة جوابك في المكان المخصص.**

ساعة _____ دقيقة _____

21ب.في اليوم الدراسي العادي، كم من الوقت قضيت أمام جهاز الكمبيوتر؟ **يرجى كتابة جوابك في المكان المخصص.**

ساعة _____ دقيقة _____

الأسئلة التالية تتعلق بتناولك للتبغ.

22. هل قمت بالتدخين يومًا؟ **يرجى وضع علامة على مربع واحد فقط.**

نعم	☐ *01*
لا	☐ *02*

23. في أي سن قمت بتدخين السجائر لأول مرة (أكثر من مجرد نفخة)؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

11 سنة أو أقل	☐ *01*
12 سنة	☐ *02*
13 سنة	☐ *03*
14 سنة	☐ *04*
15 سنة	☐ *05*
16 سنة	☐ *06*
أبدًا	☐ *07*

24. كم مرة تقوم بتدخين التبغ في الوقت الحاضر؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لا أدخن أبدًا	☐ *01*
كل يوم	☐ *02*
مرة واحدة في الأسبوع على الأقل لكن ليس كل يوم	☐ *03*
أقل من مرة واحدة في الأسبوع	☐ *04*

فيما يلي نود أن نسألك عن استخدامك للحشيش.

28. هل استخدمت الحشيش يومًا؟ **يرجى وضع علامة في مربع واحد مطابق بأفضل شكل لكل خط.**

نعم	☐ *01* **يرجى الانتقال إلى السؤال 28أ**
لا	☐ *02* **يرجى الانتقال إلى السؤال 30**
لا أرغب بالقول	☐ *03* **يرجى الانتقال إلى السؤال 30**

28أ. متى استخدمت الحشيش آخر مرة؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

11 سنة أو أقل	☐ 01
12 سنة	☐ 02
13 سنة	☐ 03
14 سنة	☐ 04
15 سنة	☐ 05
16 سنة أو أكثر	☐ 06

وهنا بعض الأسئلة حول مضايقة الغير. نقول بأن أحد الطلبة يتعرض للمضايقة عندما يقول طالب آخر، أو مجموعة من الطلاب، أو يقومون بأمور سيئة ومزعجة ضده أو ضدها. ونعتبرها أيضًا مضايقة عندما يتم إزعاج أحد الطلبة مرارًا وتكرارًا بطريقة لا يحبها أو تحبها، أو عندما يتم تجاهله أو تجاهلها بتعمد. لكن لا تعتبر مضايقة عندما يقوم اثنين من الطلاب ذوي قوة أو قدرة متساوية بالجدال أو القتال. كما لا تعتبر مضايقة عند إزعاج أحد الطلبة بطريقة ودية ومرحة.

30. كم مرة تمت مضايقتك في المدرسة في الشهرين الماضيين؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لم أتعرض لمضايقات في المدرسة في الشهرين الماضيين	01 ☐
حدث ذلك مرة واحدة أو مرتين فقط	02 ☐
مرتين أو 3 مرات في الشهر	03 ☐
حوالي مرة واحدة في الأسبوع	04 ☐
عدة مرات في الأسبوع	05 ☐

31. كم مرة شاركت في مضايقة طالب آخر / طلاب آخرين في المدرسة في الشهرين الماضيين؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لم أقم بمضايقة طالب آخر/طلاب آخرين في المدرسة في الشهرين الماضيين	01 ☐
حدث ذلك مرة واحدة أو مرتين فقط	02 ☐
مرتين أو ثلاث مرات في الشهر	03 ☐
حوالي مرة واحدة في الشهر	04 ☐
عدة مرات في الأسبوع	05 ☐

نود الآن أن نطرح عليك أسئلة حول عائلتك وأصدقائك.

32. ما مدى السهولة بالنسبة لك أن تتحدث إلى الأشخاص التاليين حول الأمور التي تزعجك حقًا؟ **يرجى وضع علامة في مربع واحد لكل خط.**

	سهل جدًا	سهل	صعب	صعب جدًا	لا أرى هذا الشخص أو ليس موجودًا لدي
1. الأب					
2. زوج الأم					
3. الأم					
4. زوجة الأب					
5. الأخ/الأخوة الأكبر سنًا					
6. الأخت/الأخوات الأكبر سنًا					
7. أفضل صديق					
8. أصدقاء من نفس الجنس					
9. أصدقاء من الجنس الآخر					
	01	03	04	05	

33أ. في الوقت الحاضر، كم عدد الأصدقاء المقربين لديك من الذكور والإناث؟ **يرجى وضع علامة على مربع واحد فقط لكل عمود.**

	ذكور	إناث
لا أصدقاء مقربين	01 ☐	01 ☐
صديق واحد/صديقة واحدة	02 ☐	02 ☐
صديقان/صديقتان	03 ☐	03 ☐
ثلاث أصدقاء/صديقات أو أكثر	04 ☐	04 ☐

33ب.كم يومًا في الأسبوع تمضي عادة بعض الوقت مع الأصدقاء وجهًا لوجه مباشرة بعد المدرسة؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أبدًا	يوم واحد	يومان	3 أيام	4 أيام	5 أيام	(6 أيام)
(01)	(02)	(03)	(04)	(05)	(06)	(07)

33ج. كم مرة تخرج اسبوعيا بالمساء مع أصدقائك؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أبدًا	أمسية واحدة	أمسيتان	3 أمسيات	4 أمسيات	5 أمسيات	6 أمسيات	7 أمسيات
(01)	(02)	(03)	(04)	(05)	(06)	(07)	(08)

33د. كم مرة تتحدث إلى أصدقائك على الهاتف أو ترسل لهم رسائل قصيرة (اس ام اس) أو تتصل بهم من خلال الانترنت؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نادرًا أو أبدًا ☐ 01
يوم واحد أو يومان في الأسبوع ☐ 02
3 أو 4 أيام في الأسبوع ☐ 03
5 أو 6 أيام في الأسبوع ☐ 04
كل يوم ☐ 05

34أ. كيف تشعر اتجاه المدرسة في الوقت الحاضر؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أحب المدرسة كثيرًا ☐ 01
أحب المدرسة قليلا ☐ 02
لا أحب المدرسة كثيرًا ☐ 03
لا أحب المدرسة على الإطلاق ☐ 04

34ب.برأيك، ما هو رأي معلمتك/معلماتك في الصف حول أدائك المدرسي مقارنة مع زملائك في الدراسة؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

جيد جدًا ☐ 01
جيد ☐ 02
متوسط ☐ 03
أقل من متوسط ☐ 04

34ج. الى أي درجة تشعر بضغط الواجبات المدرسية التي ينبغي عليك القيام بها؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أبدًا ☐ 01
قليلا ☐ 02
بعض الشيء ☐ 03
كثيرًا ☐ 04

نود الآن أن نسألك عن النمط العام لحياتك مع عائلتك.

35أ. هل تملك عائلتك سيارة أو فان أو شاحنة؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

لا ☐ 01
نعم، واحدة ☐ 02
نعم، اثنتان أو أكثر ☐ 03

35ب. هل لديك غرفة نوم خاصة بك؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01*
لا ☐ *02*

35ج. خلال الـ 12 شهرًا الماضية، كم مرة سافرت في عطلة / إجازة مع عائلتك؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

أبدًا ☐ *01*
مرة واحدة ☐ *02*
مرتان ☐ *03*
أكثر من مرتين ☐ *04*

35د. ما هو عدد أجهزة الكمبيوتر (بما في ذلك الألعاب وأجهزة الكمبيوتر الشخصية وأجهزة الكمبيوتر المحمولة) التي تملكها عائلتك؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

ليس لدي جهاز كمبيوتر ☐ *01*
جهاز واحد ☐ *02*
جهازين ☐ *03*
أكثر من اثنين ☐ *04*

36أ. هل منزلك مزوّد بإحدى أنظمة التدفئة أو تكييف التالية؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نظام تدفئة أو تكييف مركزية ☐ *01*
نظام تدفئة ثابتة أخرى (مثل) فرن ☐ *02*
نظام تدفئة محمولة (مثل) مروحة أو مدفأة كهربائية الخ ☐ *03*
لا أعرف ☐ *04*

36ب. هل في منزلك أي أو كل مما يلي؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

	نعم *(01)*	**لا** *(02)*
المياه الجارية (في الأنابيب)	☐	☐
المياه الساخنة (في الأنابيب)	☐	☐
تكييف الهواء	☐	☐
الزجاج المزدوج	☐	☐
جهاز إنذار ضد السرقة	☐	☐

الاغتسال أو الاستحمام:

☐ نعم، تستخدمها الأسرة فقط *01* ☐ نعم، نتقاسمها مع أسر أخرى *02* ☐ لا *03*

الحمام (داخل المنزل):

☐ نعم، تستخدمها الأسرة فقط *01* ☐ نعم، نتقاسمها مع أسر أخرى *02* ☐ لا *03*

أخيرا، نود أن نطرح عليك بعض الأسئلة حول البيئة.

37. هل عانيت من ازعاج الجيران أو ضجيج الشارع (المرور، الأعمال، المصانع التجارية، الخ)؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم ☐ *01*
لا ☐ *02*

وزارة التربية
إدارة البحوث والتطوير التربوي

38. كم يبعد منزلك عن أقرب طريق مزدحم (مثلاً أقرب طريق مع ازدحام سيارات دائم أو متكرر ومركبات ثقيلة تعبر من هناك)؟ **يرجى وضع علامة في مربع واحد.**

أقل من 20 م	☐ 01
20-50م	☐ 02
50-150م	☐ 03
أكثر من 150م	☐ 04

39. بالرجوع إلى الأشهر الـ 12 الماضية، عندما كنت في المنزل، إلى أي مدى كنت تعاني من الضجيج الآتي من الخارج (مثل زحمة السير وحركة الطائرات والمصانع والجيران والحيوانات والمطاعم)؟

لم أعاني من ذلك	☐ 01
عانيت بعض الشيء	☐ 02
عانيت بشدة	☐ 03

40. هل المنطقة التي تعيش فيها عرضة للجرائم أو العنف أو التخريب؟ **يرجى وضع علامة في المربع المطابق لإجابتك**

نعم	☐ 01
لا	☐ 02

شكرا جزيلاً لمساعدتك في الإجابة على هذه الأسئلة

وزارة التربية

إدارة البحوث والتطوير التربوي

Appendix D : EURO-URHIS2 project youth questionnaire (English)

Appendix E

A complete list of the Urban Health Indicators (UHIs) assessed as categorical and continuous variables to generate the urban health profiles in the univariate comparisons between young people in Kuwait City and Jahra. For further information on special considerations for UHIs at the analysis stage please review Section 6.6.4

UHI	Variable Type	Presented in Results Section	Question number on youth survey
Gender	Categorical	Chapter 7.2	Q1
Country of Birth	Categorical	Chapter 7.2	Q5
Duration of Residence	Categorical	Chapter 7.2	Q6
Family Affluence Scale (FAS)	Continuous and categorical	Chapter 7.3	Q35-36
Quality of Residence	Categorical	Chapter 7.3	Q36
Self-perceived general health	Categorical	Chapter 7.4.1	Q7
Psychosomatic symptoms	Categorical	Chapter 7.4.2	Q16
Bronchial Asthma	Categorical	Chapter 7.4.3	Q8-9
Rhinitis and hay fever	Categorical	Chapter 7.4.4	Q10
Eczema	Categorical	Chapter 7.4.5	Q11
Oral Health (regular tooth brushing)	Categorical	Chapter 7.5.1	Q19
Frequent Television Watching (≥ 2 hours on weekdays)	Categorical	Chapter 7.5.2	Q21
Physical activity (daily and weekly)	Categorical	Chapter 7.5.3	Q17
Regular fruit consumption (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Regular salad/vegetable consumption (on most days of the week)	Categorical	Chapter 7.5.4	Q18

Regular Fizzy and/or low-calorie drink consumption (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Regular meat consumption (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Rarely/never eat fish	Categorical	Chapter 7.5.4	Q18
Regular diary produce consumption (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Rarely/never consume dairy products	Categorical	Chapter 7.5.4	Q18
Regular consumption of vegetable-based proteins (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Once a week consumption of vegetable-based proteins	Categorical	Chapter 7.5.4	Q18
Regular consumption of sugar coated cereals (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Regular consumption of chocolates/sweets (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Regular consumption of crisps (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Regular consumption of wholemeal bread (on most days of the week)	Categorical	Chapter 7.5.4	Q18
Rarely/never eat wholemeal bread	Categorical	Chapter 7.5.4	Q18
Experienced outdoor noise (at home)	Categorical	Chapter 7.6	Q37
Exposure to severe noise in past 12 months	Categorical	Chapter 7.6	Q39
Home 50 metres or less from a busy road	Categorical	Chapter 7.6	Q38

Home more than 150 metres from a busy road	Categorical	Chapter 7.6	Q38
Crime, vandalism, and violence in their area	Categorical	Chapter 7.6	Q40
Involvement in a road traffic accident	Categorical	Chapter 7.6	Q12
Involvement in a school-based accident	Categorical	Chapter 7.6	Q12
Involvement in a home/leisure accident	Categorical	Chapter 7.6	Q12
Being bullied (at least twice in the past 2 months)	Categorical	Chapter 7.6	Q30
Bullied others (at least twice in the past 2 months)	Categorical	Chapter 7.6	Q31
Feelings of dislike towards school	Categorical	Chapter 7.6	Q34
A lot of pressure from school work	Categorical	Chapter 7.6	Q34
Height (in cm)	Continuous	Chapter 8.1.1	Manually measured
Weight (in kg)	Continuous	Chapter 8.1.1	Manually measured
BMI (Body Mass Index)	Continuous, then analysed categorically based on IOTF and WHO cut-offs	Chapter 8.1.1	Calculated using manually measured height and weight (age calculated from Q3 and Q4)
Following a diet (to gain or lose weight)	Categorical	Chapter 8.1.1	Q20
Perceive weight as normal and not following a diet	Categorical	Chapter 8.1.1	Q20

Ever smoked tobacco (in the past)	Categorical	Chapter 8.2.1	Q22
Smoke tobacco at least weekly	Categorical	Chapter 8.2.1	Q24
First smoked ≤ 13 years	Categorical	Chapter 8.2.1	Q23
Daily smoking tobacco	Categorical	Chapter 8.2.1	Q24
Ever used cannabis (in the past)	Categorical	Chapter 8.2.1	Q28
Elevated risk of psychological distress (denoted by SDQ score of ≥ 20)	Categorical and continuous	Chapter 8.3.1	Q15
Pro-Social Score	Categorical	Chapter 8.3.1	Q15
Low Back Pain (in the past month)	Categorical	Chapter 8.3.3	Q14

Appendix F

A) Dependent variable: Obesity (BMI ≥30)

Below is a list of pre-selected outcome (independent) variables analysed using univariate logistic regression in both Jahra and Kuwait City for association with obesity (categorical variable). Variables that were found to be associated with obesity (dependent variable) at p≤ 0.1 were included in the multivariate logistic regression analysis in Chapter 8.1.2

Urban health Indicators (independent variables)	Variable type and Description
Demographic Indicator (Contextual) Variables	
Gender	Categorical (girls/boys)
SES (continuous variable)	Family Affluence Scale (analysed as continuous and categorical)
Health Outcome/Status Variables	
Following a diet	Categorical (yes/no)
Good self-perceived health	Categorical (yes/no)
Psychological Distress	Categorical (denoted by SDQ scores: Normal/Abnormal)
Psychosomatic Symptoms	Categorical (yes/no: denoted by a lot of headaches, stomach aches or sickness in the past 6 months)
Low Back Pain (LBP)	Categorical (yes/no: LBP in the past month)
Lifestyle Factors Variables	
Vigorous Physical Activity (weekly)	Categorical (yes/no: ≥ 2 hours of vigorous physical activity per week)
Physical activity (daily)	Categorical (yes/no: ≥ 60mins per day of physical activity)
Ever smoked tobacco	Categorical (yes/no: ever smoked tobacco in the past)
Regular salad/vegetables consumption	Categorical (yes/no: regular consumption of salads and/or vegetables on most days of the week)
Regular fruit consumption	Categorical (yes/no: regular consumption of fruits on most days of the week)
Regular dairy produce consumption	Categorical (yes/no: regular consumption of dairy produce on most days of the week)
Regular fizzy/low calorie drink consumption	Categorical (yes/no: regular consumption of fizzy and/or low-calorie drinks on most days of the week)
Frequently watching television	Categorical (yes/no: watching more than 2 hours of television on weekdays)
Environmental Variables	
Being bullied ≥ twice in past 2 months	Categorical (yes/no: being bullied at least twice in the past two months)

B) Dependent variable: Ever Smoking Tobacco

Below is a list of pre-selected outcome (independent) variables analysed using univariate logistic regression in both Jahra and Kuwait City for association with ever smoking tobacco (categorical variable). Variables that were found to be associated with ever smoking tobacco (dependent variable) at p≤0.1 were included in the multivariate logistic regression analysis in Chapter 8.2.2

Urban health Indicators (independent variables)	Variable type and Description
Demographic Indicator (Contextual) Variables	
Gender	Categorical (girls/boys)
SES (continuous variable)	Family Affluence Scale (Analysed as continuous and categorical)
Health Outcome/Status Variables	
Good self-perceived health	Categorical (yes/no)
Psychological Distress	Continuous variable (denoted by SDQ scores)
Psychosomatic Symptoms	Categorical (yes/no: denoted by a lot of headaches, stomach aches or sickness in the past 6 months)
Low Back Pain (LBP)	Categorical (yes/no: LBP in the past month)
Lifestyle Factors Variables	
Overweight or Obese	Categorical (yes/no: BMI ≥ 25)
Obese	Categorical (yes/no: BMI ≥ 30)
Physical activity (daily)	Categorical (yes/no: ≥ 60mins per day of physical activity)
Environmental Variables	
Being bullied ≥ twice in past 2 months	Categorical (yes/no: being bullied at least twice in the past two months)
Crime and Violence in Area	Categorical (yes/no: students that self-reported the presence of crime, violence and/or vandalism in their area)

C) Dependent variable: Psychological Distress (denoted by SDQ score of ≥20)

Below is a list of pre-selected outcome (independent) variables analysed using univariate logistic regression in both Jahra and Kuwait City for association with psychological distress (categorical variable). Variables that were found to be associated with psychological distress (dependent variable) at p≤ 0.1 were included in the multivariate logistic regression analysis in Chapter 8.3.2

Urban health Indicators (independent variables)	Variable type and Description
Demographic Indicator (Contextual) Variables	
Gender	Categorical (girls/boys)
SES (continuous variable)	Family Affluence Scale (Analysed as continuous and categorical)
Health Outcome/Status Variables	
Good self-perceived health	Categorical (yes/no)
Lifestyle Factors Variables	
Obesity	Categorical (yes/no: BMI ≥ 30)
Ever smoked tobacco	Categorical (yes/no: students that have ever smoked tobacco in the past)
Physical activity (weekly)	Categorical (yes/no: ≥ 2 hours of vigorous physical activity per week)
Frequently watching television	Categorical (yes/no: watching more than 2 hours of television on weekdays)
Environmental Variables	
Being bullied ≥ twice in past 2 months	Categorical (yes/no: being bullied at least twice in the past two months)
Involved in a road traffic accident	Categorical (yes/no: road traffic accident that resulted in an injury in the past year)
Exposure to severe noise	Categorical (yes/no: self-reported exposure to severe noise near their homes in the past year)
Crime and Violence in Area	Categorical (yes/no: self-reported the presence of crime, violence and/or vandalism in their area)

D) **Dependent variable: Low Back Pain (LBP) in the past month**

Below is a list of pre-selected outcome (independent) variables analysed using univariate logistic regression in both Jahra and Kuwait City for association with low back pain in the past month (categorical variable). Variables that were found to be associated with low back pain (dependent variable) at p≤0.1 were included in the multivariate logistic regression analysis in Chapter 8.3.4

Urban health Indicators (independent variables)	Variable type and Description
Demographic Indicator (Contextual) Variables	
Gender	Categorical (girls/boys)
SES (continuous variable)	Family Affluence Scale (Analysed as continuous and categorical)
Health Outcome/Status Variables	
Psychological Distress	Continuous variable (denoted by SDQ scores)
Psychosomatic Symptoms	Categorical (yes/no: denoted by a lot of headaches, stomach aches or sickness in the past 6 months)
Lifestyle Factors Variables	
Overweight or Obese	Categorical (yes/no: BMI ≥ 25)
Obesity	Categorical (yes/no: BMI ≥ 30)
Ever smoked tobacco	Categorical (yes/no: students that have ever smoked tobacco in the past)
Physical activity (weekly)	Categorical (yes/no: ≥ 2 hours of vigorous physical activity per week)
Environmental Variables	
Being bullied ≥ twice in past 2 months	Categorical (yes/no: being bullied at least twice in the past two months)
Involved in a road traffic accident	Categorical (yes/no: road traffic accident that resulted in an injury in the past year)
Crime and Violence in Area	Categorical (yes/no: self-reported the presence of crime, violence and/or vandalism in their area)

Appendix G

1) **Multiple logistic regression model for Obesity (Dependent Variable) – multivariate analysis results presented in Table 8.6**

Jahra :

List of independent variables examined in multiple logistic regression model for the association with Obesity (dependent) variable in Jahra. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$.

- Gender (categorical)
- Following a diet (categorical)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Jahra measures the association between obesity (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	32.723	3	.000
	Block	32.723	3	.000
	Model	32.723	3	.000

Urban Area = Jahra

Kuwait City:

List of independent variables examined in multiple logistic regression model for the association with Obesity (dependent) variable in Kuwait City. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$:

- Gender (categorical)
- Good self-perceived health (categorical)

- Following a diet (categorical)
- Physical activity ≥ 2hrs per week (categorical)
- Physical activity ≥ 60 mins per day (categorical)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Kuwait City measures the association between obesity (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	66.071	6	.000
	Block	66.071	6	.000
	Model	66.071	6	.000

Urban Area : Kuwait City

2) Multiple logistic regression model for Ever Smoked Tobacco (Dependent Variable) – multivariate analysis results presented in Table 8.9

Jahra :

List of independent variables examined in multiple logistic regression model for the association with Obesity (dependent) variable in Jahra. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$.

- Gender (categorical)
- Crime/Violence in the area (categorical)
- Psychological Distress (continuous variable – denoted by SDQ scores)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Jahra measures the association between ever smoking tobacco (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	139.234	4	.000
	Block	139.234	4	.000
	Model	139.234	4	.000

Urban Area = Jahra

Kuwait City:

List of independent variables examined in multiple logistic regression model for the association with ever smoking tobacco (dependent) variable in Kuwait City. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$:

- Gender (categorical)
- Crime/Violence in the area (categorical)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Kuwait City measures the association between obesity (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	110.215	3	.000
	Block	110.215	3	.000
	Model	110.215	3	.000

Urban Area = Kuwait City

3) **Multiple logistic regression model for Elevated risk of psychological distress (Dependent Variable) – multivariate analysis results presented in Table 8.12**

Jahra :

List of independent variables examined in multiple logistic regression model for the association with psychological distress (dependent) variable (denoted by ≥ 20 SDQ score) in Jahra. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$.

- Gender (categorical)
- Physical activity ≥ 2hrs per week (categorical)
- Crime/Violence in the area (categorical)
- Exposure to severe noise at home (categorical)
- Being Bullied ≥ twice/2 months (categorical)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Jahra measures the association between elevated risk of psychological distress (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	35.251	6	.000
	Block	35.251	6	.000
	Model	35.251	6	.000

Urban Area = Jahra

Kuwait City :

List of independent variables examined in multiple logistic regression model for the association with psychological distress (dependent) variable (denoted by ≥ 20 SDQ score) in

Kuwait City. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$.

- Being Bullied ≥ twice/2 months (categorical)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Kuwait City measures the association between elevated risk of psychological distress (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients[a]

		Chi-square	df	Sig.
Step 1	Step	5.001	2	.043
	Block	5.001	2	.043
	Model	5.001	2	.043

Urban Area = Kuwait City

4) Multiple logistic regression model for low back pain in the past month (Dependent Variable) – multivariate analysis results presented in Table 8.15

Jahra :

List of independent variables examined in multiple logistic regression model for the association with low back pain (dependent) variable (denoted by ≥ 20 SDQ score) in Jahra. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$.

- Gender (categorical)
- Psychosomatic symptoms (categorical)
- Being Bullied ≥ twice/2 months (categorical)
- Crime/Violence in the area (categorical)
- Elevated risk of psychological distress (continuous variable – denoted by SDQ score)

- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Jahra measures the association between low back pain (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	37.016	6	.000
	Block	37.016	6	.000
	Model	37.016	6	.000

Urban Area = Jahra

Kuwait City :

List of independent variables examined in multiple logistic regression model for the association with low back pain (dependent) variable (denoted by ≥ 20 SDQ score) in Kuwait City. All were included in the multiple logistic regression model after confirming their association with the dependent variable in the univariate analysis at $p \leq 0.1$.

- Psychosomatic symptoms (categorical)
- Crime/Violence in the area (categorical)
- Elevated risk of psychological distress (continuous variable – denoted by SDQ score)
- SES using FAS scores (continuous variable) – examined in all multivariate analyses

Based on the Omnibus Tests of model coefficients table, the multivariate model in Kuwait City measures the association between low back pain (dependent variable) and independent variables significantly well.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	21.814	4	.000
	Block	21.814	4	.000
	Model	21.814	4	.000

Urban Area = Kuwait City

Appendix H: Spreadsheet for height and weight measurement

Height and weight measurement record sheet

Name of the school : ..... **Date of visit :** .....

Class : ..... **Number of students :** .....

Code	HEIGHT	WEIGHT	F/M
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
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22			
23			
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25			
26			
27			
28			
29			
30			